

**United States Department of the Interior
Bureau of Land Management**

**Environmental Assessment
DOI-BLM-UT-C010-2014-0061-EA**

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**CS Mining, LLC
Milford Operations Area Project Expansion**

Location:
Beaver County, Utah

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1.0 PURPOSE & NEED

1.1 Introduction

This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental consequences of the Milford Operations Area (MOA) Project Expansion as proposed by CS Mining, LLC (CSM). The EA is a site-specific analysis of potential impacts that could result with the implementation of a proposed action or alternatives to the proposed action. The EA assists the BLM in project planning and ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any “significant” impacts could result from the analyzed actions. “Significance” is defined by NEPA and is found in regulation 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of “Finding of No Significant Impact” (FONSI). If the decision maker determines that this project has “significant” impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a Decision Record may be signed for the EA approving the selected alternative, whether the proposed action or another alternative. A Decision Record (DR), including a FONSI statement, documents the reasons why implementation of the selected alternative would not result in “significant” environmental impacts (effects) beyond those already addressed in Pinyon Management Framework Plan, approved June 10, 1983.

1.2 Background

The CSM MOA is located approximately seven miles northwest of Milford in Beaver County, Utah (**Figure 1.2-1**), on a mixture of public lands administered by the Bureau of Land Management (BLM), Utah School and Institutional Trust Lands Administration (SITLA) lands, and private lands owned by CSM. The CSM MOA consists of parts of Sections 5-8, 15-17, 20-23, 26-28, and 34 in Township 27 South, Range 11 West, Salt Lake Base Meridian (SLBM), and part of Section 31 in Township 26 South, Range 11 West, SLBM (**Figure 1.2-1**). The mineral proposed for extraction from this area is copper, which generally occurs with iron, molybdenum, gold, and silver in oxidized pipes and skarn deposits.

CSM proposes to increase the life expectancy of its operations by expanding mining in the existing three open pits (Hidden Treasure, Bawana, and Sunrise), as well as by opening new pits within the boundary of the MOA. CSM also proposes to conduct exploration activities on known ore bodies in the MOA.

1.3 Purpose and Need for the Proposed Action

CSM has submitted a Plan of Operations for the Milford operations area in order to explore, mine, and process mineral resources. Copper is the third most used metal, behind iron and aluminum, in the United States and the world. The metal has diverse and well established uses on which modern society relies heavily. Total copper demand in the United States in 2011 was estimated at 3.92 billion pounds. While 35 percent of this demand is being met by scrap

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recovery and recycling, the remainder must be extracted from naturally occurring deposits of copper-containing minerals. The proposed action has the ultimate goal of supporting the extraction and recovery of known deposits of copper mineralization from private and BLM lands in the permit area.

With regard to the activities proposed and regulated under the applicable 43 CFR 3809 regulations, consistent with section 2 of the Mining and Policy Act of 1970 and section 102(a)(7), (8), and (12) of the Federal Land Policy and Management Act, it is the policy of the Department of the Interior to encourage the development of Federal mineral resources and reclamation of disturbed lands. Under the mining laws, a person has statutory right, consistent with Departmental regulations, to go upon the open Federal lands for the purpose of mineral prospecting, exploration, development, extraction, and uses reasonably incident thereto.

1.4 Conformance with BLM Land Use Plan(s)

The Proposed Action is subject to the Pinyon Management Framework Plan, approved June 10, 1983. Although the Proposed Action is not specifically mentioned in the plan, it is clearly consistent with the objectives, goals, and decisions of the approved plan. It has been determined that the proposed action would not conflict with other decisions throughout the plan.

1.5 Relationship to Statutes, Regulations, or Other Plans

To date, there have been six EAs prepared by the BLM in concurrence with the expanding and evolving operations. The EAs are:

- DOI-BLM-UT-C010-2013-0053-EA December 2013 – Hidden Treasure Mine – Amendment 3
- DOI-BLM-UT-C010-2012-0020-EA September 2012 - Hidden Treasure Mine
- DOI-BLM-UT-C010-2009-0054-EA September 2009 - Sunrise Exploration Project
- DOI-BLM-UT-C010-2009-0061-EA August 2009 - Bawana Stockpile Removal
- DOI-BLM-UT-C010-2009-0027 January 2009 - Copper Ranch Exploration
- EA UT-040-06-34 September 2008 - Candy B Exploration

The Proposed Action is consistent with federal, state and local laws, regulations, and plans to the maximum extent possible, including the following:

- Section 2 of the Mining and Policy Act of 1970 and section 102(a)(7), (8), and (12) of the Federal Land Policy and Management Act, it is the policy of the Department of the Interior to encourage the development of Federal mineral resources and reclamation of disturbed lands. Under the mining laws, a person has statutory right, consistent with Departmental regulations, to go upon the open Federal lands for the purpose of mineral prospecting, exploration, development, extraction, and uses reasonably incident thereto Taylor Grazing Act of 1934
- Utah Standards and Guidelines for Rangeland Health
- Federal Land Policy and Management Act of 1976
- Section 106 of the National Historic Preservation Act of 1966, as amended
- Memorandum of Understanding Between the BLM Cedar City Field Office (CCFO) and Paiute Indian Tribe of Utah

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- 1962 Bald and Golden Eagle Protection Act
- Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), as amended.
- Migratory Bird Treaty Act
- Utah Comprehensive Wildlife Conservation Strategy (CWCS)
- Utah Partners in Flight Avian Conservation Strategy Version 2.0.
- Birds of conservation concern 2002
- Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds
- IM 2008-050, Migratory Bird Treaty Act - Interim Management Guidance
- Best Management Practices for Raptors and Their Associated Habitats in Utah (IM: 2006-096)

Utah's Standards for Rangeland Health address upland soils, riparian/wetlands, desired and native species and water quality. These resources are either analyzed later in this document or, if not impacted, are listed in the attached Interdisciplinary Team NEPA Checklist (**Appendix A**).

1.6 Identification of Issues

Public notification was initiated by entering the project information on the Environmental Notification Bulletin Board (ENBB), a BLM environmental information site on October 8, 2014. To date, no comments have been received concerning the project.

The proposed action was reviewed by an interdisciplinary team. How resources in the area might be affected were identified. The results of this review are contained in the Interdisciplinary Team Checklist, **Appendix A**. Resource which might be affected include cultural resources, invasive weeds, livestock grazing, mineral resources, socio-economics, soils, vegetation and wildlife.

1.7 Issues Considered but Eliminated from Further Analysis

No other issues have been considered for analysis.

1.8 Summary

This chapter has presented the purpose and need of the proposed project, as well as the relevant issues, i.e., those elements of the human environment that could be affected by the implementation of the proposed project. In order to meet the purpose and need of the proposed project in a way that resolves the issues, the BLM has considered and/or developed a range of action alternatives. These alternatives are presented in Chapter 2. The potential environmental impacts or consequences resulting from the implementation of each alternative considered in detail are analyzed in Chapter 4 for each of the identified issues.

2.0 DESCRIPTION OF ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 Introduction

This environmental assessment focuses on the Proposed and No Action alternatives. Other alternatives were not considered because the issues identified during scoping did not indicate a need for additional alternatives or mitigation beyond those contained in the proposed action. The no action alternative is considered and analyzed to provide a baseline for comparison of the impacts of the proposed action.

2.2 Alternative A – Proposed Action

The Proposed Action is for the BLM to consider approval of CSM's proposal for further development related to surface mining and processing activities within the MOA, as outlined throughout this section. Due to the relatively small and scattered nature of the copper deposits within the MOA, CSM proposes to continue to conduct mining, processing, and reclamation activities on the currently active areas, while concurrently developing new exploration targets for new open pit development, and improving existing infrastructure.

The Proposed Action would include two main types of operation:

- Exploration
- Mining Future Pits

In addition, there would be associated ancillary/support facilities or components, such as haul roads, fencing, signing, runoff control features, and monitoring wells. CSM also proposes to improve existing infrastructure such as power lines and water lines for better efficiency on an as-needed basis. These are described after the two types of operation. Approximate acreages of proposed disturbance are listed in **Table 2.2-1** below.

Mining is anticipated to be completed in stages: concurrent development of new mines while existing mines are in the process of being reclaimed. As is described in **Mining Activities** below, many of the current or proposed pits will be backfilled with waste rock from future pits.

Table 2.2 –1 General Disturbances for the MOA Project Expansion

Operation Area/ acres	Project Component	BLM Lands (acres)	Private Lands (acres)	SITLA Lands (acres)	Total Disturbance (acres)
Proposed Open Pits and Dumps	Hidden Treasure Expansion	40	10	0	50
	Sunrise Expansion	60	30	0	90
	Copper Ranch	145	40	50	235

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Operation Area/acres	Project Component	BLM Lands (acres)	Private Lands (acres)	SITLA Lands (acres)	Total Disturbance (acres)
	Candy B/Maria	130	40	0	170
	Crossroads	20	0	0	20
	Niagara/Copper Hill	0	60	0	60
Proposed Exploration Targets	Big Wash	80	0	0	80
	Crossroads	60	0	0	60
Proposed Ancillary Facilities	Haul roads	60	40	20	120
	Power Lines	50	50	N/A	100
	Water Lines	70	70	N/A	140
	Miscellaneous ancillary facilities	50	50	N/A	100
TOTALS		765	390	70	1225

Exploration

The MOA has numerous targets for potential copper ore bodies, as discovered during a magnetic survey of the area by CSM in 2009 (Emerson GIS 2009). Currently, CSM is proposing exploration plans for two additional targets: Big Wash and Crossroads (**Figure 2.2-1**). In addition, many of the approved exploration targets that have been analyzed in the six EAs written to date could expand to include further drill holes if ore bodies are encountered during initial drilling. CSM will provide the necessary agencies with updated drill plans prior to expanding exploration operations. Upon completion of the exploration projects, any disturbed lands will be ripped and prepared for seeding during the upcoming fall season.

Big Wash Exploration

The Big Wash Exploration project area is located in Sections 27, 28, 33 and 34, T. 27 S., R 11 W., SLBM. The area has a high magnetic anomaly with similarities to the known skarn ore deposits in the immediate area. No known drilling has been performed to characterize the possibility of an additional ore deposit. CSM is proposing to drill an initial 8 drill holes to identify possible resources. Additional drill holes would follow depending on the results of the initial 8 drill holes. The defined exploration area is approximately 400 acres in size, all located on BLM land. Of those 400 acres, approximately 80 acres are proposed to be disturbed for exploration and condemnation purposes. At any given time during the exploration project, however, roads and pads will only be prepared for six holes; three for current drilling, and three prepared for immediate mobilization to the next area. Once the initial three holes have been completed, the area will be ripped and prepared for seeding during the upcoming fall season. So although the overall disturbance is anticipated to be 80 acres, due to concurrent reclamation, only 20 acres are anticipated to be left un-reclaimed at any given time.

Crossroads Exploration

The Crossroads Exploration project area is located in Sections 7, 17 and 18, T. 27 S., R. 11 W., SLBM. The initial proposed exploration would be the drilling of 42 holes on 200 foot centers. It is anticipated that an additional 500 drill holes would be drilled depending on the initial drilling results. The project area is approximately 295 acres located completely on lands administered by BLM. Of those 295 acres, approximately 60 acres are proposed to be disturbed for exploration and condemnation purposes. At any given time during the exploration project, however, roads and pads will only be prepared for six holes; three for current drilling, and three prepared for immediate mobilization to the next area. Once the initial three holes have been completed, the area will be ripped and prepared for seeding during the upcoming fall season. So although the overall disturbance is anticipated to be 60 acres, due to concurrent reclamation, only 20 acres are anticipated to be left un-reclaimed at any given time.

Mining Activities

CSM proposes to develop four more open pits, each with their own respective waste dump and topsoil stockpile: Niagara/Copper Hill, Copper Ranch, Candy B/Maria, and Crossroads. CSM would conduct mining in proposed pits by use of open pit mining methods. CSM would utilize such mining methods as drilling and blasting, loading material via loader or track hoe, and hauling material to their respective areas (waste dump or process facilities) with 60-ton or 100-ton haul trucks. For all proposed pits and associated dumps, available topsoil from the areas would be salvaged and stockpiled prior to commencement of mining. The topsoil stockpiles would be seeded with an interim seed mix provided in CSM's Utah Division of Oil, Gas and Mining (UDOGM) Notice of Intent (NOI) to help minimize erosion and the encroachment of noxious weeds. A complete copy of CSM's UDOGM NOI can be found [online](#).

Concurrent reclamation of the pits, dumps, and haul roads would be performed as mining in new areas commence. Reclamation for all new disturbances would be performed according to standards set by UDOGM and the BLM, and would follow similar guidelines as the currently approved areas of disturbance.

Hidden Treasure and Sunrise Expansion

Both the Hidden Treasure and the Sunrise open pits are proposed to be expanded beyond their currently approved footprint. The expansion of the Hidden Treasure pit would follow the Hidden Treasure vein to the northwest on BLM land. The proposed timeline for expanding the Hidden Treasure pit would occur between the years 2016 and 2017, after the Candy B/Maria pit has been extended to the south and southeast. The reason for the timing is so the waste material from the Hidden Treasure Expansion can be used to backfill the north end of the Candy B/Maria pit. Backfilling of the Candy B/Maria pit would continue as allowable by the extension of the Candy B/Maria pit to the south and southeast.

The approximate acreage associated with the expansion of the Hidden Treasure mine is 30 acres for the pit, and 20 acres for the dump, since waste material from the initial layback of the Maria pit would be deposited on the Hidden Treasure Dump. Forty acres of the new disturbance related to the Hidden Treasure expansion would occur on BLM land.

The expansion of the Sunrise pit would encompass the Old Hickory pit, which is a historic pit located northwest of the Sunrise pit (**Figure 2.2-1**). As the Sunrise pit expanded to the north, the

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southern portion of the existing pit would begin to be backfilled with waste material. Although backfilling of the southern portion of the Sunrise pit would occur concurrently with extension to the north, the waste dump would also be expanded to include any remaining waste material. The approximate acreage associated with the expansion of the Sunrise mine is 50 acres for the pit, and 40 acres for the mine waste dump, for a total new disturbance of 90 acres. Approximately 60 acres of the new disturbance related to the Sunrise mine and dump expansion would occur on BLM land. Expansion of the Sunrise pit and dump would likely occur between the years 2015 and 2017, depending on finalizing logistics and obtaining necessary permits.

Niagara/Copper Hill Pit and Waste Dump

The Niagara/Copper Hill deposit is located directly north of the currently approved Bawana pit. The proposed open pit and related haulage roads for the Niagara/Copper Hill deposit would encompass 60 acres of private land. The waste rock from the Niagara/Copper Hill mine is proposed to be used to completely backfill the Bawana Pit. Any remaining waste that is encountered during mining of the Niagara/Copper Hill deposit would be placed as lifts on the existing Bawana waste dump. The total footprint of the Niagara/Copper Hill waste dump would be within existing disturbance related to the Bawana waste dump, so no additional acreage would be disturbed. Commencement of mining operations in the Niagara/Copper Hill pit would likely occur between the years 2014 and 2015, depending on finalizing logistics and obtaining necessary permits.

Copper Ranch Pit and Waste Dump

Under UDOGM exploration permit E/001/0159, CSM has drilled 354 holes to explore and delineate the ore reserve near the Copper Ranch Knoll. The average drill hole depth is 295 feet with the deepest single hole at 845 feet. CSM is proposing to develop an open pit mine and dump to be located on BLM, private, and SITLA lands located in Sections 16 and 17, T. 27 S., R. 11 W., SLBM (**Figure 2.2-1**). The pit would be 80 acres with 40 acres located on BLM, 40 acres on private and 5 acres on SITLA lands. The dump would be 150 total acres with 105 acres located on BLM and 45 acres on SITLA lands. Commencement of mining operations in the Copper Ranch Pit would likely occur between the years 2014 and 2017, depending on finalizing logistics and obtaining necessary permits.

Candy B/Maria Pit and Waste Dump

Under UDOGM exploration permit E/001/0152, CSM's predecessor, Western Utah Copper Company (WUCC) drilled 35 holes to explore and delineate the ore reserve near the Candy B and C patented mining claims. The average drill hole depth is 573 feet with the deepest single hole at 985 feet. CSM is proposing to develop an open pit mine and dump on BLM and private lands located in Sections 22, 23, 26 and 27, T. 27 S., R. 11 W., SLB&M (**Figure 2.2-1**). The pit would encompass the existing Maria pit and disturbance, which totals 30 acres of existing disturbed area. The proposed Candy B/Maria pit would be a total of 100 acres of new disturbance, with 60 acres located on BLM land and 40 acres located on private land. The initial waste material from the Candy B/Maria pit would be placed as lifts on the exiting Hidden Treasure waste dump. Once the Hidden Treasure waste dump has reached capacity without extending beyond its current footprint, waste material would be placed in a proposed waste dump located on the western flank of the southern end of the Rocky Range (**Figure 2.2-1**). The dump would be 70 acres, all of which would be located on BLM land. Commencement of mining

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operations in the Candy B/Maria Pit would likely occur between the years 2014 and 2015, depending on finalizing logistics and obtaining necessary permits.

Crossroads Pit and Waste Dump

There has been limited drilling in the vicinity of the proposed Crossroads pit. A known copper deposit is exposed on the surface of a proposed small pit. The Crossroads pit and dump would total 20 acres, all on BLM lands located in Section 7, T. 27 S., R. 11 W., SLBM. Commencement of mining operations in the Crossroads Pit would likely occur in the year 2016, depending on finalizing logistics and obtaining necessary permits.

Processing Facilities

There are no proposed process facilities related to the MOA project expansion at this time. In the future, if CSM decides to add additional process facilities, an amended plan would be submitted to the appropriate agencies.

Tailings Facilities

There would be no new tailings facilities related to the MOA project expansion at this time. In the future, if CSM decides to add an additional tailings facility, an amended plan would be submitted to the appropriate agencies.

Ancillary Features

Ancillary facilities include new haul roads, realignment of existing haul roads, power lines, water lines, and other small features that assist in the mining and processing of copper ore. Ancillary facilities would most likely be located on a mixture of private, state, and public land. CSM would like to request an allotment of 230 acres of BLM land for ancillary facilities as outlined in this section.

Haul Road Re-alignment

CSM would need to re-align their existing haul road because two of the identified ore bodies lie directly under the haul road. The Candy B/Maria pit and the Copper Ranch pit would eliminate the existing haul road when the ore deposits were mined. The proposed alignment would run from the Candy B/Maria pit location in the NW1/4 of Section 22, through the NE1/4 of Section 21 until it intersects SITLA land in Section 16, a distance of 0.85 miles. Thence through the SW1/4 of Section 16 (0.70 miles); through private patented land (0.23 miles) and then through BLM lands (1.36 miles) where it would intersect with the existing haul near the proposed Crossroads pit.

The new haul road alignment would be approximately 16,579 feet (3.14 miles) in length and 100 feet wide for a total of approximately 40 acres. A total of 27 acres would be on BLM lands, 10 acres on SITLA lands, and 3 acres on private patented lands. Other proposed disturbances related to haul road improvements, such as widening existing haul roads, or creating new haul roads for proposed pit and dump expansions, would potentially impact an additional 33 acres of BLM land.

Water Line, Power Line, and Miscellaneous Ancillary Facilities and Disturbances

Associated with the MOA project expansion would be installation of improved power and water lines. Although the details of the power and water line routes are not fully known, the most

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likely course of action would be for any new or improved route to either follow existing routes, right-of-ways (ROWs), or parallel existing haul roads. If a new route is later proposed on undisturbed land, not within any haul road or power line easement or existing route, CSM would submit the revised plan to the BLM for review.

Miscellaneous ancillary facilities and disturbances that might occur in conjunction with the MOA project expansion include: temporary construction laydown areas, storm water control features (such as berms, ditches, turn-outs, and sumps); and pads for temporary structures such as portable office trailers or storage containers.

Design Features to Minimize Impacts

Design features proposed by CSM to minimize impacts are contained in **Appendix B**.

Reclamation

At the conclusion of current and proposed operations, CSM would reclaim the MOA using standards outlined in **Appendix B**, and in more detail in CSM's UDOGM NOI. If at any time the BLM would like reclamation of disturbances within the MOA to be performed differently than what is specified in the UDOGM NOI, CSM would work with all applicable Federal and State agencies on a revised reclamation plan that meets the agencies' standards.

2.3 Alternative B – No Action

The no action alternative would not allow the proposed disturbances to occur on BLM lands. The no action alternative could be chosen if the proposed action would result in undue and unnecessary degradation of public lands. The proposed action could also be revised so that exploration and mining could be completed without causing unnecessary or undue degradation.

Under the mining laws, the project proponent has the statutory right to enter and conduct exploration, mining and mining related activity, subject to applicable laws and regulations. The Federal Land Policy and Management Act of Oct. 21, 1976 directed the Secretary of the Interior to take any action necessary by regulation or otherwise to prevent undue and unnecessary degradation of the public lands. With respect to surface disturbances associated with unpatented mining claims, the Secretary of the Interior has implemented the 43 CFR 3809 regulations to accomplish this mandate. Undue and unnecessary degradation is currently defined in the regulations as a failure to comply with the performance standards of 43 CFR 3809.420, a failure to follow the terms and conditions of an approved plan of operations, a failure to comply with other State and Federal laws related to environmental protection and the protection of cultural resources and a failure to demonstrate that the operations are reasonably incident to prospecting, mining, or processing operations.

2.4 Alternatives Considered, but Eliminated from Further Analysis

No other alternatives were considered because impacts would not likely be fewer using other locations or facilities.

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This chapter presents the potentially affected existing environment (i.e., the physical, biological, social, and economic values and resources) of the impact area as identified in the Interdisciplinary Team Checklist found in **Appendix A** and presented in Chapter 1 of this assessment. This chapter provides the baseline for comparison of impacts/consequences described in Chapter 4.

3.2 General Setting

Current approved disturbance for the CSM MOA is approximately 456 acres of a mixture of Federal (BLM), State, and private land (**Table 3.2-1**). This disturbance includes open pits, waste dumps, topsoil stockpiles, process facilities, ancillary facilities, and tailings dams. CSM currently mines copper and magnetite ore from three pits: Hidden Treasure, Bawana, and Sunrise. Material extracted from the pits are either placed in the respective mine waste dumps, or hauled to the process facilities located northwest of the pits. The life expectancies of the pits under CSM's currently approved mine plan are: six months for the Hidden Treasure Pit; two months for the Bawana Pit; and two months for the Sunrise Pit. The total life expectancy of the MOA at the time this report was written is a little less than one year.

Table 3.2-1 Currently Approved Disturbance for the CSM MOA

Type of Operations	Public Land (BLM) Disturbance (acres)	Private Land Disturbance (acres)	State Land Disturbance (acres)	Total Approved Disturbance (acres)
Open Pits	27.18	28.13	0	55.31
Waste Dumps	139.97	12.94	0	152.91
Topsoil/Ore Stockpiles	7.2	10.5	6.1	23.8
Access and Haul Roads	19.6	9.9	4.9	34.4
Process Facilities	0	96.3	0	96.3
Intermediate tailings disposal facility (ITDF)	0	89.6	0	89.6
Ancillary Facilities	2.7	1.1	0	3.8
TOTAL DISTURBANCE	196.65	248.47	11	456.12

A description of the existing exploration and mining disturbances is contained in **Appendix C**.

3.3 Resources/Issues Brought Forward for Analysis

The affected environment of the proposed action and no action alternatives were considered and analyzed by an interdisciplinary team as documented in the Interdisciplinary Team Checklist, **Appendix A**. The checklist indicates which resources of concern are either not present in the project area or would not be impacted to a degree that requires detailed analysis. Resources

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which could be impacted to a level requiring further analysis are described in this chapter and impacts to these resources are analyzed in Chapter 4.

3.3.1 Cultural Resources

Cultural resources are the evidence of how humans relate to their environment which can be seen through examples such as cultural uses of the environment, the built environment, and human social institutions. There are three major categories of cultural resources in the Cedar City Field Office: prehistoric and historical resources, architectural resources, and traditional cultural properties (TCPs).

From 1982-2012, 31 cultural resource pedestrian surveys were conducted within the area of potential affect (APE), see Table 1. All of these surveys conducted were for cultural resources clearance for earlier mining-related projects. The 31 sites found include 25 historical sites, 2 multicomponent sites (containing both historical and prehistoric components), and 4 prehistoric sites. Historical sites are mainly mining-related activities such as prospect pits, mining claim markers, refuse scatters and mines, while prehistoric sites are mainly lithic scatters. Diagnostic artifacts found for the prehistoric sites indicate an Archaic to Fremont occupation of this area. Of the 31 sites, 9 are eligible for the National Register of Historic Places (NRHP) and 22 are not eligible for the NRHP.

Table 1. Cultural Surveys

State Project Number	Project Title	Acres Surveyed in APE	% of APE Surveyed
U82UA0076	IPP Intensive	17.3	0.2%
U94BL0462	Rocky Range Well	2.2	0.0%
U95BL0719	Kiewet Mining - Railroad Ballast	3.1	0.0%
U95BL0720	West Hills Gravel Exploration	0.5	0.0%
U95IG0562	Kiewit Mining Group - Range Quarry and Roads	26.3	0.3%
U96IG0343	Ross Centurion Mines Powerline	49.1	0.6%
U97AS0655	Twin Mountain Rock Quarry Expansion Area	55.4	0.7%
U97BL0140	Indian Ridge Prescribed Burn	3.5	0.0%
U98BL0418	Nevada Star Mining Plan	39.7	0.5%
U02BL0367	Western Utah Copper Mine	7.4	0.1%
U03BL1098	PV Notice	8.8	0.1%
U04BL0361	Coyote Spring Pipeline	20.2	0.2%
U04BL1258	Wind Energy Test Tower	2.3	0.0%
U04IG0533	Dotson-Milford Mineral Belt, Drill and Access	5.7	0.1%
U05BL0868	Hidden Treasure Roads	28.3	0.3%
U05IG0046	Dotson-Beaver Lake West Drill Sites Survey	6.4	0.1%
U05IG0649	Dotson-Rocky Range Drill Sites	8.8	0.1%
U06BL1725	Milford Ballast Rock Quarry Permit	1.4	0.0%

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	Application Project		
U06IG1419	Dotson - ECB - WCB Drill Sites and Access Road	3.9	0.0%
U06ME0101	Milford Gas Pipeline	55.3	0.7%
U06SQ1530	NSL To Las Vegas 400 Mile Pipeline UNEV	42.8	0.5%
U07IG1440	Dotson-Candy B BLM Lease Survey	39.5	0.5%
U08IG0093	Dotson - Water Well Drill Sites Survey	3.8	0.0%
U08IG1148	WUCC - Copper Range Survey	218.1	2.7%
U08IG1149	WUCC - Concentrator Water System Survey	10.6	0.1%
U09EO0612	Sigurd to Red Butte Transmission Corridor	2.6	0.0%
U09IG0273	WUCC- Sunrise Mine Survey	131.7	1.6%
U10EO0510	Sigurd To Red Butte Transmission Line	19.8	0.2%
U12HO0544	A Cultural Resource Inventory Of The CS Mining Milford Copper Mine Power Line Corridor, Beaver County, Utah	4.5	0.1%
U12HO0692	A Cultural Resource Inventory Of The Bawana & Sunrise Mine Exploration Areas & Waterline Corridor, Beaver County, Utah	418.5	5.2%
U12HO1000	Hidden Treasure West	932.3	11.5%
TOTAL		2169.9	26.8%

3.3.2 Livestock Grazing

The project area is located in the Frisco Allotment, which has the following use:

PERMITTEE	ALLOT-MENT	NUMBER OF LIVESTOCK	KIND OF LIVESTOCK	SEASON OF USE	PERCENT PUBLIC LAND	AUMS*
R. Larson Sheep Co.	Frisco	2640	Sheep	10/16-03/31	92%	2683
		1800	Sheep	04/01-05/31		664
		50	Cattle	10/16-05/31	100%	376

*Animal Unit Months

The vegetative monitoring report completed at the time of the grazing permit renewal in 2008 concluded that the Standards and Guidelines for Healthy Rangelands were being met within the Frisco Allotment with the exception of Standard 3. Rangeland Health Standards and Guidelines Assessments were completed within the allotments in August of 2006. Standard 3 was not being met within the allotment due to the presence of cheatgrass, broom snakeweed, and halogeton. However, it was determined that these areas within the allotment are making progress toward

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meeting the standard. The allotment was in a severe drought between 1999 and 2004, which was determined to be a causal factor for the conditions of the allotment. In addition, it was determined that mining, exploration, and historic livestock grazing had introduced the invasive species and these species were spread through those continued activities. Furthermore, it was determined that in isolated areas of disturbance within the Frisco Allotment it would take chemical and mechanical treatment to move the vegetation to a more diverse plant community with an increase in perennial grasses and forbs that would improve the habitat for most wildlife species.

Utilization has been collected following the grazing permit renewal to assess livestock grazing. Utilization collected in 2009 and 2011 were within acceptable utilization objectives.

3.3.3 Mineral Resources

The proposed action would remove ore and waste material from the pits specified in Chapter 2 of this EA. An inventory of indicated or inferred tonnage of ore contained in each ore deposit was performed in 2013. The results of that inventory are specified in **Table 3.3-1** below.

Table 3.3-1 Indicated or Inferred Ore Tonnage for Deposits within the CSM MOA

DEPOSIT	STATUS	ORE TONNAGE	ORE GRADE
BAWANA	Indicated	175,000	0.91%
NIAGARA/ COPPERHILL	Inferred	1,500,000	1.70%
SUNRISE	Inferred	1,021,000	1.12%
HIDDEN TREASURE	Indicated	448,000	1.80%
COPPER RANCH	Indicated	6,288,000	0.65%
CANDY B	Inferred	11,600,000	0.81%
MARIA	Indicated	787,000	1.13%
TOTALS		21,819,000	1.23%

Due to the nature of mine modeling, actual tons of ore and waste anticipated to be moved during mining activities is still unknown.

3.3.4 Socioeconomics

The project area falls in the center of Beaver County, which is a large, mostly rural county with an overall population of about 6,460 in 2013 (USCB 2014). The population of the county is concentrated in three communities: Beaver, Minersville, and Milford. Milford, with a population of 1,409, is the closest community to the proposed project area, being about four miles to the southeast. Total wages in the county totaled \$90 million in 2013 of which \$9.2 million (10 percent) was attributable to jobs in mining. There were 193 employed in the mining industry in Beaver County in 2013 (BLS 2014). The principal employers being CS Mining (the current project proponent) and Martin Marietta Minerals, which operates the Milford Quarry, a ballast rock quarrying operation.

3.3.5 Soils

There is no published Natural Resources Conservation System (NRCS) soil survey data available for this area and digital data is “spotty” such that only portions of the project area have received preliminary mapping in which the soil series were defined. Generally speaking, the project is located on shallow to deep gravelly, cobbly or stoney semi-desert loam ecological sites, which occur on dissected alluvial fans and valley plains. The soils are formed in alluvium derived mainly from mixed igneous parent materials. Soils on the valley floor and transition areas can be deep and well drained. Soils on side slopes are shallow to bedrock. Topsoils on these sites are not abundant, ranging in depth from zero to 12 inches to a generally alkaline heavy clay layer. The potential for soil loss from sites in depleted condition is approximately 5 tons per acre per year. Soils on the side slopes are shallow to bedrock and potential losses are proportionately less, as less erodible soils are exposed to the elements and are instead under protective rock armor.

3.3.6 Vegetation, including Invasive Species

The plant community is characterized by an overstory of either Wyoming big sagebrush or black sagebrush. Sometimes the two species hybridize, making plant identification difficult. This particular area likely receives from 6 to 8 inches of precipitation, so regardless of the species, the sagebrush is short, generally less than 2 feet tall and capable of providing protection from the erosive forces of wind and water. This plant community is in a moderately depleted range condition, likely because of its close proximity to Milford, Utah, from which hundreds of thousands of grazing animals were freighted historically. This area would have likely been a “holding area” for livestock awaiting shipment. As a result, it has kept its sagebrush overstory, but desirable understory species (e.g. Indian ricegrass, bottlebrush squirreltail and globemallow) are lacking.

When ecological sites such as those described for this site are subject to disturbances of soils and vegetation, such as grazing or mining, noxious and invasive plants (eg cheatgrass, rabbitbrush, Russian thistle and halogeton) can thrive. Reclamation of this site would prove difficult because of the low moisture it receives, shallow and potentially highly alkaline soils and the potentially high density of invasive species, which would compete for nutrients and limited available moisture. Reclamation seed mixes (both interim and final) should contain plant species which are relatively aggressive and competitive with invasive weeds.

Historic mine dumps in the area, which have not been disturbed in the last 50 years, have partially revegetated without being dominated by halogeton, while areas which were more recently disturbed are covered in halogeton, in spite of multiple reseeding attempts. This is likely due to a decrease in precipitation in the region. Redisturbing these historic dumps could further increase the presence of invasive weeds. It is more likely that successful revegetation would occur by not disturbing revegetating slopes and reclaiming newer disturbances using a terrace system. This process would not disturb the entire dump face during reclamation, but would place terraces on the dump slope which would be used for topsoil placement and reseeding. Concentrating topsoil and water use in these smaller areas could improve vegetative recovery and reduce the encroachment of halogeton.

3.3.7 Wildlife

The project area is generally semi-arid, high-desert country characterized by dissected hills of relatively low relief surrounded by valley flats. The project area is located between 5,200 and 5,800 feet elevation above mean sea level in an area with flats dominated by big sagebrush (*Artemisia tridentata*) and the hills/mountains dominated by black sagebrush (*Artemisia nova*). Sagebrush provides important winter habitat for several wildlife species (e.g., mule deer and pronghorn) and localized habitat for sagebrush-obligate species (e.g., pygmy rabbit and Brewer's sparrow). Sagebrush also provides important breeding, nesting, and brood-rearing habitat for these species and others.

General wildlife observations were made along with surveys for raptors and bats, conducted in the project area on several occasions during 2013 (JBR 2013) and 2014 (JBR 2014). This section describes the results of raptor and bat surveys, and also describes big game and other potential wildlife in the area.

Animals observed within or directly adjacent to the project area are listed in Table 3.3-2 in Appendix D.

Raptors

Special habitat needs for raptors include nest sites, foraging areas, and roosting or resting sites. Buffer zones are usually recommended around raptor nest sites during early spring and summer when raptors are raising their young. The most utilized raptor nesting areas are generally found along riparian areas and cliff faces.

Sixty large stick nests, suitable for use by raptors, were found/checked (JBR 2014) within the general raptor and golden eagle survey areas, which included the Rocky Range Mountains, the southern portion of the Beaver Lake Mountains, and the northern portion of the Star Range. Of the nests found/checked 10 were active, 6 with raptor species and 4 being used by ravens.

Golden eagles (*Aquila chrysaetos*) have been noted both within and near the project area. They are year round residents. Three active golden eagle nests have been discovered within the five-mile buffer of the MOA. There are consistent sightings of both adult and juvenile golden eagles within the MOA that further supports that golden eagles do nest in the vicinity (JBR 2014).

Of three active golden eagle nests identified during the 2014 survey (JBR 2014), two were successful and fledged chicks. Nest UT040002012 at the extreme north end of the survey area fledged two chicks. Nest UT040002020 at the extreme south end of the survey area fledged at least one chick and possibly two. Due to the nest location, extremely high on a rock face, and the depth of the nest, it was very difficult for surveyors to achieve a vantage point to see into the nest. One nest (UNK_012) failed. An eagle pair was observed improving this nest by surveyors during early spring, and a subsequent visit to the nest later in the 2014 nesting season confirmed a golden eagle incubating at the site. A final return visit to the nest for the purpose of verifying nesting success found the nest to be prematurely vacated. Surveyors were able to get higher than the nest and utilizing a spotting scope to see into the nest; there was no evidence of adult eagles or chicks in or near the nest. No deceased chicks were found in or under the nest, rather the nest was confirmed to be completely empty. The failed golden eagle nest was located adjacent to an

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active common raven nest and during every previous nest site monitoring period ravens were observed harassing the nesting golden eagles.

Ferruginous hawk (*Buteo regalis*) have also been documented in the general area. Multiple years of raptor nest surveys have not documented any ferruginous hawk nests within 0.5 mile of the Project Area until the 2104 survey when a ferruginous hawk nest was identified in a power line structure next to the Marietta Mine crusher yard. This nest was active and fledged chicks.

The project area is suitable red-tailed hawk (*Buteo jamaicensis*) foraging habitat. One red-tailed hawk nesting territory has been documented within the 1-mile buffer of the MOA. It is a stick nest on a power line structure adjacent to a dirt road. This nest was active in 2012, but gone in 2013. It is unknown if an alternate nest within the territory was used..

Several raptor individuals (unassociated with nests) were seen during the general raptor survey event; two ferruginous hawks were seen courting and copulating near the edge of the 1-mile buffer survey area boundary but no nest was located in or near the survey area. Several American kestrels (*Falco sparverius*), were also noted flying through the survey area but none were found to be nesting within the survey area. Prairie falcons were observed flying over the project area and two active prairie falcon nests were discovered well outside the 0.5-mile buffer.

Bats

There are four locations noted in or near the project area that have potential to contain bats. These locations include the old Sunrise adit, the Montreal adit, the Old Hickory 100 Level adit, and the Niagara adit. Appendix D contains information regarding species observed in surveys conducted in 2013 and 2014.

Of the bat species detected, only the Townsend's big-eared bat (*Corynorhinus townsendii*) and the fringed myotis (*Myotis thysanodes*) are considered special status species (BLM sensitive). The Townsend's big-eared bat was detected on the recordings at both the Niagara and Old Hickory adits during the fall acoustical monitoring period while the fringed myotis was only detected at the Niagara adit, during the spring acoustical monitoring period (JBR 2014). Fringed Myotis are present based on only two call sequences identified to this species; it is possible these two sequences are a different species, but due to their conservation status they were included.

Migratory Birds

Migratory birds are important components of biological diversity and indicators of environmental conditions at local, regional, and global scales. A variety of migratory birds are found in the project area. The most commonly occupied breeding habitat for migratory birds in the project area is sagebrush shrub steppe. A complete list of birds noted during the survey is located in **Table 3.3-3, located in Appendix D.**

Big Game

The project area is not in crucial winter range for mule deer or range for elk. However, it is within a large area that has been mapped by the Utah Division of Wildlife Resources as crucial yearlong pronghorn habitat (BLM 2013a). The mapped habitat covers the valleys of the western

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deserts of Utah from Iron County to southern Box Elder County. Pronghorn are speedy ungulates that occur in open, dry habitats. In Utah, nearly all pronghorn populations occur in shrubsteppe containing large expanses of open, low, rolling, or flat terrain (UDWR 2009). The project area is located within the Southwest Desert Herd Management Area, which contains about 2 million acres of crucial yearlong habitat. The herd unit is below the population objective (BLM 2013b). The site characteristics provide suitable habitat: open country with sagebrush and perennial grasses and forbs. The project area is not known to be important pronghorn fawning nor wintering habitats. Pronghorn use of the project area appears to be limited due to low population numbers in this portion of the unit, limited species distribution in the area, and current levels of human disturbance (BLM 2013a).

Threatened, Endangered, Candidate, or Sensitive Animal Species

Table 3.3-4, in Appendix D, lists all special status animal species occurring in the Cedar City Field Office planning area. Special status species that have a moderate to high probability of being impacted by the project include burrowing owl (*Athene cunicularia*), , big free-tailed bat (*Nyctinomops macrotis*) , fringed myotis, spotted bat (*Euderma maculatum*), Townsend's big-eared bat, and Western red bat (*Lasirurs blossewillii*). Other species would not be found in the survey area due to lack of suitable habitat. Details about their habitat are listed in **Table 3.3-4 in Appendix D**.

4.0 ENVIRONMENTAL IMPACTS

4.1 Direct and Indirect Impacts

Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

4.1.1 Alternative A – Proposed Action

Cultural Resources

The results of the cultural resource records search indicate both prehistoric and historical use of the proposed action area. Based on the previously recorded sites within the proposed action area, expected cultural resources include prehistoric sites with artifacts commonly attributed to the Archaic through the Fremont cultural phases, while historical resources will be primarily mining-related.

During the cultural resource records search, 9 NRHP-Eligible sites were noted within the Proposed Action area. Due to the nature of the Proposed Action, these sites would be adversely affected if disturbed. A historic properties treatment plan would be developed and implemented to resolve adverse effects to these historic properties.

Class III cultural surveys would be completed before any surface disturbing activity was initiated. Most historic properties found would be avoided. Historic properties which could not be avoided would be mitigated in coordination with the Utah State Historic Preservation Office. About 9 sites incorporating approximately 51 acres of historic properties may be affected.

Livestock Grazing

The proposed project would disturb vegetation on 765 acres of BLM administered land which would reduce the AUMs on the allotment by approximately 64. This could reduce the current permitted livestock use on the Frisco Allotment by 9 head of cattle or 63 head of sheep. This would be a reduction of 18% of the allotted number of cattle and about a 1% reduction in the allotted number of sheep. The kind of livestock, season of use, grazing system, and water resources would not be changed or impacted by the project.

4.1.1.1 Mineral Resources

Approximately 22 million tons of copper-bearing minerals would be permanently removed from land within the MOA. Waste rock moved during mining operations would either be placed on new or expanded dumps, or would be used to backfill existing and/or proposed open pits. The local topography would be altered both by the creation and/or expansion of open pits, and by the storage of waste overburden and interburden.

4.1.1.2 Socioeconomics

The proposed action would directly employ roughly 250 people. Most of the economic benefits would accrue to Milford, the nearest community. This represents 9.2 percent of the workforce in

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Beaver County, and the average wages and benefits of those employed are considerably above the average. Additional economic benefits could be expected to accrue to Milford and Beaver County via the multiplier effect, this being economic benefits and indirect additional jobs created to services and supply the direct mining jobs.

4.1.1.4 Soils

Soils would be disturbed on a total of approximately 1,225 acres (765 public and 460 private and/or State). Due to CSM's commitment to conduct concurrent reclamation, at any given time during the life of the MOA, it is anticipated that only 700 total acres would be disturbed. Expansion of pits and dumps would have a potential soil disturbance of approximately 395 acres of public, 180 acres of private, and 50 acres of State land. Pit and dump expansion would involve scraping and removing plant growth medium (anything appearing as "topsoil"). Soils could be lost through a combination of wind and water erosion. These scraped and removed soils would be stored on topsoil stockpiles, which would be comprised of approximately 30 public and 20 private acres. Additionally, approximately 230 acres of public, 210 acres of private, and 20 acres of State land soils would likely be disturbed as a result of constructing and / or widening the haul roads. Exploration disturbance would temporarily displace approximately 140 acres of public land soils.

During operations and storage, disturbed soils could be lost at a rate of 5 tons per acres per year to wind and water erosion. However, anticipated loss of topsoil would likely be much less due to stipulations the proponent has adopted as a part of the proposed action. These include interim seeding of soil stockpiles and final seeding. Haul roads would be graveled, watered, or have magnesium chloride or other approved tackifiers applied as needed to reduce fugitive dust. Additional mitigation would be required for problematic soil stockpiles, which are prone to continuous fugitive dust problems (see mitigation measures).

4.1.1.5 Vegetation

Vegetation would be affected on the same acreages as described for soils. There would be a long term loss of sagebrush steppe community, which ranges in condition from poor to fair. Primary values lost would be protective cover for soils, wildlife habitat and livestock and wild horse forage.

The sagebrush community would be lost for the life of the mining operation and then for some indeterminate amount of time following, during which sagebrush would re-establish through artificial means such as reseeding with a seed mix which includes sagebrush, or through natural means, of letting sagebrush encroach into the disturbed areas from seed source remaining on the edge of the disturbance. Losses to vegetation are partially mitigated through stipulations the proponent has adopted, such as stockpiling soils and reseeding them, monitoring and treating noxious (and some invasive) plant species, and its long term reclamation plan of respreading topsoil and planting with a final seed mix.

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4.1.1.6 Wildlife

A total of 1,225 acres would be disturbed under the Proposed Action; 140 acres for exploration and 1,085 acres for mine expansion and associated facilities.

Human activity and disturbance would be new in the Big Wash and Crossroads exploration areas, as there are no existing mining activities occurring in those areas. However, overall impacts to wildlife from exploration activities would be negligible to minor and short term. Habitat, 140 acres total, would be temporarily impacted from drilling activities under the Proposed Action. The disturbance at the drill locations would be reclaimed and re-seeded after drilling and thus would be a short-term loss. Suitable habitat is abundant and available adjacent to the project area. Minimal indirect effects to some small, less mobile individuals would likely occur as they could be forced to disperse from the area or may be killed or injured during exploration activities. Wildlife in the area would likely be displaced temporarily during active drilling activities into adjacent undisturbed habitat. Impacts to entire populations are not anticipated.

In areas of existing mining activities, wildlife has likely been displaced or habituated to the noise and activity. Although mine activities would be expanded onto adjacent lands, overall impacts to wildlife in these areas would also be negligible to minor, but long term (for the life of the project). Reclamation would occur concurrently with mining; an expended pit would be reclaimed as mining at another pit commenced, therefore not all 1,085 acres of habitat would be impacted at once.

Raptors

Direct impacts to golden eagles are not anticipated as a result of the proposed action.

Golden eagles would be indirectly impacted by the loss of foraging habitat. This impact would vary depending on the quality and quantity of habitat disturbed at any given point in time; but at maximum disturbance acreages it is still expected to be minor. Displacement of eagles to adjacent suitable habitat is anticipated however the impact would be minor. Due to the presence of ongoing operations at both the CSM project and the nearby Rocky Range ballast mine, eagles in this area are likely habituated to mining disturbances such as people, haul trucks, and blasting.

Any raptor could be attracted to the mining and haul road areas to scavenge road kill. If this occurred, they could be hit by haul trucks. However, BLM is unaware of road kills within the MOA, except for an occasional snake.

Bats

Bats can be very sensitive to human disturbance and sound, causing them to abandon roosts, including maternity colonies and hibernacula. Disturbances during winter may cause bats to wake up, or come out of torpor, expending additional calories which can cause death. Several of the bat species documented in the project area in 2014 also winter in Utah and a few may be active during warmer periods in the winter.

Existing studies address two obvious possible impacts to roosting or hibernating bats subjected to blasting caused vibrations: 1) severe vibrations causing roof failure and crushing fatalities

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and, 2) lesser vibrations rousing bats from their hibernation torpor with the attendant negative effect of depleting critical body reserves.

Vibration estimates suggest that it is very unlikely that any acute adverse effect (death) would occur to any hibernating or roosting bats due to roof fall but that some risk exists that bats could be awakened from torpor.

Bats entering or leaving the adits would probably be disturbed by activity from the nearby pits, dumps, and haul roads. The noise and lights could disrupt flight and foraging patterns. Further, under the proposed action, eventually all the adits in the area would be destroyed. In order to minimize the potential for impacting bats, these adits would be monitored and efforts made to ensure that adits are free of bats prior to destroying.

A worst case scenario would predict displacement and death of a few hundred individuals of several species, including Townsend's big-eared bats and fringed myotis, both sensitive species. A best case scenario would be based on no bats using the adits when mining commences, however unlikely, and that impacts would be the loss of foraging habitat and displacement when bats return to the area in the spring. The actual impact is likely somewhere in between.

Migratory Birds

The potential direct impacts to migratory bird species would include the short-term loss of 140 acres and long-term loss of approximately 1,085 acres of potentially suitable breeding and foraging habitat including sagebrush and black sagebrush, as well as impacts from noise and dust, described below. Not all 1,225 acres would be disturbed at the same time as reclamation at one pit would occur as another is being mined and the same with exploration drilling. Direct impacts to breeding birds (including raptors) would be minimized by avoiding habitat removal between March 15 and July 31. If habitat removal or disturbance were to occur between March 15 and July 31, breeding bird surveys on public and private lands in the project area would be implemented, and appropriate mitigation prescribed in cooperation with the BLM, USFWS, and UDWR.

Vegetation removal in the MOA would reduce potential habitat for migratory bird nesting, cover, and foraging. The vegetation in these areas would be removed for the long term (the life of the project) and be unavailable for migratory birds during that time. An altered type of potentially suitable habitat would be available after reclamation activities. Impacts to migratory birds from habitat losses would be minor and long term. Due to the relatively small scale of operations (1,225 acres of disturbance) and extensive shrubland habitat available in the area, overall populations of migratory birds would not be affected.

Indirect impacts to habitat surrounding the disturbance areas (i.e., not directly disturbed) would occur as a result of project operations, specifically as a result of dust and noise introductions. Dust that falls on surrounding vegetation may make it less palatable for foraging as well as less suitable for bird nesting and breeding. Dust would be controlled in the project area by water trucks, which would lessen dust impacts. Overall, dust would have minor and long-term impacts on the suitability of migratory bird habitats surrounding the project area. Some individuals may utilize areas further away from project disturbances in avoidance of dust and project noise. Populations of migratory birds would not be affected.

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Noise from project construction and operations, including the blasting activities, would make surrounding areas less suitable for nesting and breeding. Natural factors such as topography, vegetation, and temperature can reduce noise over distance.

Birds would likely displace to similar habitat away from the noise or become habituated to it, especially in areas where mining activities already occur. Anthropogenic impacts would last for the life of the project. These impacts to nesting migratory bird habitat use would be for the life of the project, but minor because birds could nest elsewhere if the project area is unsuitable. Therefore, only nests that are initially undetected or established after construction may be adversely affected by noise or human presence.

Big Game

Pronghorn that use or migrate through the disturbance areas may be affected by the loss of habitat as they would have to circumvent the project area. Further, pronghorn would be impacted by increased noise and traffic. They would move to other areas. However, these effects are not expected to extend to population growth rates or reproduction within the larger population (i.e., moderate effects) because of the small size of the project area.

There could be pronghorn-vehicle collisions and subsequent fatalities, although this is not anticipated. No impacts to the population are anticipated due to the limited use that pronghorn make of the project area and the large area of adjacent suitable habitat. No impacts are anticipated to the local pronghorn population or to hunting opportunities. For these reasons the project would be in compliance with Executive Order 13443, Facilitation of Hunting Heritage and Wildlife Conservation.

There would be a direct loss of approximately 1,225 acres of wildlife habitat from this project. The disturbance impacts would extend outward and would impact many more acres, depending upon species. Disturbances from the proposed project could allow for the expansion of cheatgrass and invasion of noxious weeds which would impact long-term habitat quality. Disturbed lands would be restored as soon as practicable and weeds would be controlled at all times. Reclamation seed mixes would contain species adapted to low precipitation, as well as sagebrush and native grasses and forbs.

Big game habitat losses are approximately 1,085 acres of crucial year-long pronghorn habitat which would be lost for the long term (life of the project), until successful reclamation of the project area. In general, big game would be expected to habituate to the disturbances and continue to use the surrounding habitats as they do currently, including seasonal movements. Thus, habitat fragmentation impacts to big game are expected to be minor and long term.

Threatened, Endangered, Candidate or Sensitive Animal Species

Impacts to the special status birds with moderate to high potential to occur in the project area would be the same as general impacts discussed for Migratory Birds; long term and minor, with the implementation of spatial/seasonal buffers. Most of the general impacts described in this section for wildlife also apply to the remaining special status species, discussed below. Pre-construction surveys would be conducted to determine the presence of these species in the

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project area, and if found, the application of spatial and seasonal (timing) buffers would follow BLM guidance (BLM 2006).

Impacts to special status bats would be the same as general impacts discussed for bats, above. However, of these only the fringed myotis and Townsend's big ear bat were identified during bat surveys.

4.1.2 Alternative B – No Action

Since the No Action Alternative would only involve a modification to reduce impacts, and mitigation measures determined necessary are included in the Proposed Action, impacts from the No Action Alternative would be expected to be similar to those resulting from the Proposed Action Alternative.

4.2 Cumulative Impacts Analysis

Cumulative impacts are those impacts resulting from the incremental impact of an action when added to other past, present, or reasonably foreseeable actions regardless of what agency or person undertakes such other actions.

4.2.1 Cumulative Impact Area (CIA)

The cumulative impact area is dependent on the resource of concern. For cultural resources, minerals resources, soils, wildlife, and vegetation, the CIA is limited to portions of the adjacent hydrologic unit code (HUC) 12 boundaries, taken to the Beaver River to the east (**Figure 4.2-1**). For livestock grazing, the CIA is limited to the Frisco Allotment. For socio-economics, the CIA is assumed to be Beaver County, although some workers commute from Iron County.

4.2.2 Past and Present Actions

The southern end of the Rocky Range and the Beaver Lake Mountains have been highly impacted by historic and recent mining activities. Historic mining disturbances, having occurred prior to federal and state mining reclamation acts, were left unreclaimed. Mineral exploration and extractive activities remain the principal source of land disturbance in the present. Past impacts to vegetation, soils, wildlife and its habitat have occurred from mining activities (both historical and modern), transportation projects such as roads and railroads, historical and current grazing, recreation, and development associated with the town of Milford. Off road vehicle use may increase due to the increase in human population and the popularity of these vehicles.

Within the MOA, the proposed operations would add to three currently active surface copper mines (the Hidden Treasure, Bawana, and Sunrise Pits), and would re-open two existing mines (the Maria and OK Pits). The MOA also includes active disturbances on private and State land consisting of milling activities, tailings storage, ore storage stockpiles and haulage roads (See **Appendix C** for complete description of current operations). A rock quarry, with a permit area of 219 acres, is located two miles north of the proposed action and is extracting up to one million tons per year of rock which is sized for use as railroad ballast. Known copper resources stretching from the southern end of the Rocky Range westward to the southern end of the Beaver Lake Mountains are currently being evaluated by the project proponent.

4.2.3 Reasonably Foreseeable Action Scenario (RFAS)

Reasonably Foreseeable Actions include the same uses as those described above. It is expected that more mineral exploration and development will be proposed in the general area into the reasonably foreseeable future. Some of this activity would occur in pre-reclamation law disturbed areas that would be re-disturbed and consequently subject to current reclamation requirements.

4.2.4 Cumulative Impact Analysis

Cultural Resources

As cultural resources are relics of man's use of the natural world, cultural resources are created and destroyed throughout time. Many of today's cultural resources were mining disturbances of the past; mining disturbances of today may produce cultural artifacts in the future. The destruction of cultural artifacts in the MOA would be cumulative to those affected by past mining related operations. The creation of new cultural resources for the future would be cumulative to those existing from previous mining activities.

Livestock Grazing

Livestock grazing in the area has been impacted historically by overutilization and mining. The Frisco Allotment has also been recently impacted by a continuing drought. These factors have reduced the available forage to the lower levels seen today. In the long term, cumulative impacts to livestock grazing should be mitigated to a certain extent as reclamation introduces new forage. However, the majority of the area will still likely contain unvegetated mine pits and scarcely vegetated mine dumps. Reclamation activities may decrease the ratio of invasive species to favorable forage in the long term.

Minerals Resources

Historic production of hardrock minerals (up until 2006) within the project area totaled roughly 2.29 million tons of copper ore, containing by-product gold and silver values. (Wray 2006) Since 2006, the current operator and project proponent together with their processor in interest have produced roughly 1 million tons of copper ore with gold and silver by-products. Historic exploration and mining activities in the project area totaled about 350 acres of disturbance. Current permitted mining and exploration disturbances in the project area total 600 acres, 450 acres of which are associated with the project proponent's activities and the balance with the adjacent ballast rock quarry.

Socio-economics

Beaver County was founded on mining and agriculture. As the number of mining operations has decreased, the economy of Beaver County has suffered. Those engaged in the development of the proposed project are currently employed by CS Mining and active on other company projects so the proposed project would maintain the current overall employment in the mining sector in the County.

Soils and Vegetation

The CIA for soils and vegetation is based on adjacent HUC 12 watershed, truncated at the Beaver River to the east, containing about 86,500 acres. Within this area there exists about

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15,500 acres of private land, 9000 acres of land administered by SITLA and about 62,000 acres of public land.

Within the CIA for soil and vegetation, a total of about 1,500 acres have been disturbed through non-grazing usage. This includes about 650 acres of pre-reclamation law exploration, mining and milling disturbances, 600 acres of presently permitted minerals-related disturbances, and about 250 acres of road disturbances. These past and current concentrated impacts to soils and vegetation are cumulative to historic impacts associated with poor grazing practices throughout much of the CIA, both of which have worked to alter vegetative diversity and has increased overall soil erosion.

Wildlife

Exploration and historic mining in the area have resulted in the loss or alteration of some areas of native habitats. As noted under Soils and Vegetation, 1,500 acres have been disturbed and have altered habitat. However, the amount of habitat disturbance is small in comparison to the overall wildlife habitat in the area. Increased human presence in the region could also cause cumulative effects to wildlife through vehicle mortalities, off-highway vehicle use, increased legal or illegal hunting, noise effects, and harassment. Although mineral exploration and mining activity could increase in the area, the remote and rural nature of the area is expected to remain, along with its value for wildlife.

The Proposed Action, in combination with past, present, and future activities in and around the MOA would combine to alter the natural setting and habitat. The level of alteration would be offset to some extent by reclamation activities. The incremental increases to the cumulative effects on wildlife species as a result of the proposed action are anticipated to be minor.

5.0 CONSULTATION AND COORDINATION

5.1 Introduction

The issue identification section of Chapter 1 identifies those issues analyzed in detail in Chapter 4. The ID Team Checklist provides the rationale for issues that were considered but not analyzed further. The issues were identified through the public and agency involvement process described in sections 5.2 and 5.3 below.

5.2 Persons, Groups, and Agencies Consulted

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
Utah State Historic Preservation Office (SHPO)	Consultation for undertakings, as required by the National Historic Preservation Act (NHPA) (16 USC 470)	Consultation with SHPO is on-going. Site specific plans would be approved before any historic properties were affected.
Paiute Indian Tribe of Utah	Consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531) and NHPA (16 USC 1531)	A meeting was held on January 22, 2015 to describe and discuss the concerns of the Tribe concerning the proposed action. The Tribe stated that they have no concerns with the project going forward, but would like to be kept informed of any changes or updates to the project.

5.3 Summary of Public Participation

During preparation of the EA, the public was notified of the proposed action by posting on the Utah Internet Homepage on October 8, 2014. No one has contacted the BLM in response to the notice. A public comment period was offered in January and February 2015.

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5.4 List of Preparers

5.4.1 BLM

See Appendix A.

5.4.2 Non-BLM Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Leslie Buhler – CS Mining, LLC	Land and Permitting Manager	2.2, 3.2, 3.3.4, Appendix B, Appendix C
Alysen Swenson – CS Mining, LLC	Environmental Specialist	2.2, 3.2, 3.3.4, Appendix B, Appendix C

6.0 REFERENCES, GLOSSARY AND ACRONYMS

6.1 References Cited

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6.2 List of Acronyms

Acronym	Definition
AUM	Animal Unit Months
BLM	Bureau of Land Management
CCFO	Cedar City Field Office
CIA	Cumulative Impact Area
CSM	CS Mining, LLC
CWCS	Utah Comprehensive Wildlife Conservation Strategy
DR	Decision Record
EA	Environmental Assessment
EIS	Environmental Impact Statement
ENBB	Environmental Notification Bulletin Board
FONSI	Finding of No Significant Impact
HUC	Hydrologic unit code
ITDF	Intermediate Tailings Disposal Facility
MOA	Milford Operations Area
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NRCS	Natural Resources Conservation System
ppv	peak particle velocities
RFAS	Reasonably Foreseeable Action Scenario
ROW	Right-of-way
SHPO	Utah State Historic Preservation Office
SITLA	Utah School and Institutional Trust Lands Administration
SLBM	Salt Lake Base Meridian
UDOGM	Utah Division of Oil, Gas and Mining
UDWR	Utah Division of Wildlife Resources
USFWS	United States Fish and Wildlife Service
WUCC	Western Utah Copper Company

APPENDICES

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APPENDIX A

INTERDISCIPLINARY TEAM NEPA CHECKLIST

Project Title: CS Mining, Milford Operations Area, Phase 2

NEPA Log Number: DOI-BLM-UT-C010-2014-0061-EA

File/Serial Number: UTU-82071

Project Leader: Ed Ginouves

DETERMINATION OF STAFF: (Choose one of the following abbreviated options for the left column)

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for significant impact analyzed in detail in the EA; or identified in a DNA as requiring further analysis

NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section C of the DNA form.

Determi- nation	Resource	Rationale for Determination*	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
NI	Air Quality	Proposed project is within an area that is attainment of National Ambient Air Quality Standards (NAAQS). Mining and milling operations similar to those proposed have been ongoing for several years under permit from the Utah Division of Air Quality (DAQ). Permitting through the DAQ would continue to occur as certain production / time thresholds were met as required by law and regulation. Dust fines (fugitive dust) would be expected to increase over the life of the project because of additional disturbance, haulage, crushing, etc. due to expansion of the mine site. These impacts are offset somewhat from placing topsoil and temporarily reseeding the waste dumps, reclaiming as they go and gravelling, watering and otherwise treating roads with tackifiers to reduce fugitive dust	C. Egerton	09/18/14
NP	Areas of Critical Environmental Concern	None within the CCFO boundaries.	D. Jacobson	10-29-2014
PI	Cultural Resources	Known prehistoric and historic sites exist within the project area. However, if all eligible archaeological sites (historic properties) are avoided and no indirect effects occur on adjacent historic sites, this undertaking may have a "no adverse effect" and NI determination. If avoidance of historic properties is not possible this project may have an adverse effect (PI determination) and would require a treatment plan and completion of the measures outlined in the treatment plan.	Jamie Palmer	10/6/2014
NI	Greenhouse Gas Emissions	The project proposal involves burning fossil carbon based fuels for clearing, mining, hauling, milling, reclamation, etc., which would produce byproducts such as CO ₂ , water vapor, etc. Ongoing research has identified the potential effects of so-called "greenhouse gas" (ghg) emissions (including CO ₂ , methane, nitrous oxide, water vapor and several trace gasses) on global climate. The release of these gasses	C. Egerton	09/18/14

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Determination	Resource	Rationale for Determination*	Signature	Date
		during mining activities is cumulative with other local ghg releases (such as traffic on local surface roads and state roads 21 and 130, the Union Pacific Railroad, etc.), regional and global releases. The lack of scientific tools to predict climate change on local or regional scales limits the ability to quantify potential future impacts as a result of this singular project or cumulatively with other activities within the analysis area with any confidence. It is thought that this project would not contribute significant levels of ghg emissions as this expansion will not substantially increase the amount of fossil fuels burned from current levels, but instead would change the location of emissions as new mining areas were opened.		
NI	Environmental Justice	No minority or economically challenged populations would be disproportionately affected.	E. Ginouves	9/10/14
NP	Farmlands (Prime or Unique)	Potential for prime, unique or important farmlands does not exist due to steep slopes, lack of topsoil and lack of irrigation water.	C. Egerton	09/18/14
PI	Fish and Wildlife Excluding USFW Designated Species	Proposal would impact up to 765 acres of habitat on public land. Habitat would be unavailable until reclamation is complete (could be several decades). No fish species would be impacted. Terrestrial wildlife may be impacted by disturbance and fragmentation of habitat. Reproduction may be impacted if implementation of initial surface disturbing activities occurs during the breeding or nesting seasons. Need to determine level of potential impacts. See attached wildlife information.	M. Crane	12/22/14
NP	Floodplains	A review of floodplain maps for Beaver County reveals the Big Wash is the nearest 100 year floodplain of any concern and it is located far enough away that this project is not expected to influence it.	C. Egerton	09/18/14
NI	Fuels/Fire Management	The proposed action would not have an impact on fire or fuels management.	M. Mendenhall	9/10/14
PI	Geology / Mineral Resources/Energy Production	The proposed action would permanently deplete a portion of the copper, gold and silver resource contained in the various skarn copper deposit proposed for surface mining. The deposits are located on previously patented mining claims (private land) and unpatented mining claims (BLM – managed land). There are no known mineral resources in the project area other than the copper, gold and silver resources proposed for extraction and deposits of stone, sand and gravel in alluvium and underlying barren bedrock.	E. Ginouves	9/10/14
PI	Hydrologic Conditions	Based upon site inspection photos, rangeland health analyses, etc., hydrologic conditions on the project site are relatively good. Little topsoil exists on the slopes, but sloping soils tend to be well armored with surface rock and vegetation in areas where surface disturbance has not occurred. Soils on the lower slopes and terraces are also relatively stable, but would be subject to both wind and water erosion if protective vegetation cover were removed. Impacts to hydrologic conditions are expected, depending on the amount of expected surface disturbance. An attempt at mitigation is made by the proposal to strip, stockpile and protect from wind and water erosion until such time that the	C. Egerton	09/22/14

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Determination	Resource	Rationale for Determination*	Signature	Date
		topsoil may be used for reclamation. The success or failure of final reclamation will be important in the restoration of hydrologic conditions. Since hydrologic conditions are so closely related to vegetation and soils, it would serve us well to combine these for the EA.		
PI	Invasive, Non-native Species	There are no known noxious weeds on site, however, disturbances such as those which are proposed create habitat in which noxious weeds and other invasives (halogeton, Russian thistle, cheatgrass) can thrive. Noxious weed issues are mitigated by the company's commitment to monitoring all public land sites for noxious weed growth and rapidly treating, through BLM approved methods, any "discovered" populations of noxious weeds. Invasive weeds are expected to be the larger problem resulting from this large mining operation. Relatively large acreages of surface disturbance are expected to occur on areas that receive low moisture, contain little to no fertile soils, etc. and are thus subject to invasion by annual weeds. The key to protecting the site from dominance by invasive weeds is the proposed approach of reclaiming disturbed areas by seeding desirable, aggressive plant species soon after the disturbance. Past experience in this area is that even when desirable, aggressive species are used for reclamation, success is often limited. New tools, such as mowing of weeds prior to seeding, periodic watering using water trucks, etc., may need to be tried. The degree of success of reclamation efforts will determine whether or not an invasive species issue remains following reclamation.	C. Egerton	09/22/14
NI	Lands/Access	There are no pending lands actions within the project area. Existing right-of-way authorizations and access will not be impacted by the project as proposed.	B. Johnson	9/10/14
PI	Livestock Grazing	The Proposed project would disturb vegetation on 765 acres of BLM administered land which would reduce the AUMs on the allotment by approximately 64. This could reduce the current permitted livestock use on the Frisco Allotment by 9 head of cattle or 63 head of sheep. The kind of livestock, season of use, grazing system, and water resources would not be changed or impacted by the project.	C. Hunter	10/7/14
PI	Migratory Birds	Proposal would impact 765 acres of habitat. Habitat would be unavailable until reclamation is complete (could be several decades). Birds may be impacted by implementation if initial surface disturbing activities occur during the nesting season. Need to determine level of potential impacts. Refer to the wildlife section of EA for more information.	M. Crane	12/22/2014
NI	Native American Religious Concerns	In the previous application and amendments, the Paiute Indian Tribe of Utah has not expressed any concerns with mining at this location, nor felt that this operation would restrict access to any sacred sites or traditional cultural properties. However the Tribe would like to see a copy of the cultural resource report once it is completed.	J. Palmer	1/22/15
NI	Paleontology	The surficial geology of the project area, is Quaternary alluvium and colluvium and falls within Class 1, very low potential for paleontological resources, using the Bureau's	E. Ginouves	9/10/14

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Determination	Resource	Rationale for Determination*	Signature	Date
		<p>Potential Fossil Yield Classification System.</p> <p>The probability of the project activity of impacting any fossil resources is negligible. No assessment or mitigation measures specific to paleontological resources are warranted.</p>		
PI	Rangeland Health Standards	The project is within the Frisco allotment. This Allotment is not meeting all of the rangeland standards. The mine activity would increase invasive and non-native species in on the allotment. See Invasive, Non-native Species. Also soils and desired vegetation may be impacted negatively.	C. Hunter	10/7/14
NI	Recreation	Other than a minor amount of dispersed recreation, there are no existing recreation resources which would be affected as a result of this proposal.	D. Jacobson	10-29-2014
PI	Socio-economics	The proposed project work have a substantial impact on local or area socioeconomics, directly employing about 200 people.	E. Ginouves	9/10/14
PI	Soils	<p>The proposal would create new disturbance of soils on approximately 765 public land acres and 390 private land acres via a connected action. In the case of road widening and creation, soils would be impacted by removal of protective vegetation and compaction, making them more susceptible to the erosional forces of wind and water. Various protections would then be put in place to stabilize soils (eg gravelling). Scraping topsoil for segregation and stockpiling would mix soil layers (horizons) and could affect the ultimate productivity of the soils by mixing topsoils with subsoils having less development and fertility and perhaps more salinity / alkalinity. Mitigation of effects on soils would include reseeding stockpiled and otherwise disturbed soils as soon as possible following the disturbance in order to establish protective vegetation cover. Mitigation also includes watering soils or otherwise covering them (erosion blankets, mulching, etc.) as needed to retain soils in place.</p>	C. Egerton	09/22/14
NI	Threatened, Endangered, Candidate or Sensitive Plant Species	There are no threatened or endangered plant species in Beaver County. There are 3 candidate and several BLM sensitive plant species in Beaver County. None of these species are found within the project area, nor is the project area considered to contain suitable or potential habitat.	J. Reese	9/10/14
PI	Threatened, Endangered, Candidate or Sensitive Animal Species	<p>The U.S. Fish and Wildlife Service has identified five threatened, endangered or candidate wildlife species as occurring in Beaver County (USFWS 2013). No habitat is present for the Western yellow-billed cuckoo, least chub, or Utah prairie dog. The California condor may forage on rare occasions in the general area, but the project is about 68 miles from known condor roosting locations. There would be no effect on condors. The project area is about 9 miles from UDWR mapped greater sage-grouse occupied habitat. No sage-grouse or their sign have been noted during numerous wildlife surveys of the project area over the past several years and the habitat is of marginal quality. Greater sage-grouse would not be impacted by the project.</p> <p>BLM sensitive species may occur within the project area. The greatest impact would most likely occur on bat species. Refer to wildlife survey report and attached analysis for more information.</p>	M. Crane	12/22/14

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Determina- tion	Resource	Rationale for Determination*	Signature	Date
NP	Wastes (hazardous or solid)	No hazardous or solid wastes as defined by RCRA will be generated or disposed of within the proposed project area.	E. Ginouves	9/10/14
NI	Water Resources/Quality (drinking/surface/ground)	Due to the nature of the topography and the nearest known surface waters, depth to underground water, it is highly unlikely that this project would affect surface or underground water. This proposal would be subject to approved permitting through the Utah Division of Water Quality and would include the development of a Storm Water Management Plan, among other things.	C. Egerton	09/22/14
NP	Wetlands/Riparian Zones	There are no riparian wetland areas within the project area	A. Stephens	9/10/14
NP	Wild and Scenic Rivers	None within the CCFO boundaries.	E. Ginouves	9/10/14
NI	Wilderness/WSA	No designated wilderness or wilderness study areas are within or adjacent to the project area.	D. Jacobson	10-29-2014
NP	Woodland / Forestry	A review of project maps reveals that there are no woodland / forestry resources in the project area.	J. Sathe	09/24/14
PI	Vegetation excluding USFW designated species	Vegetation would be removed and disturbed in this project. Disturbance levels would be the same as for soils, hydrology, etc. Appropriate seed mixes will need to be developed for final reclamation at some point.	C. Egerton	09/22/14
NI	Visual Resources	The project is proposed within visual resource management class IV area, and is consistent with that management. Reclamation proposed will maintain the area in the long term.	D. Jacobson	10-29-2014
NI	Wild Horses and Burros	The project is outside any wild horse Herd Management Area (HMA) or Herd Area (HA).	C. Hunter	10/7/14
NP	Lands with Wilderness Characteristics	The project as proposed is not in an area that was identified as having wilderness characteristics in the 2011 and the updated 2014 inventory. This area did not meet the initial size criteria to even merit conducting a wilderness characteristics inventory.	D. Jacobson	10-29-2014

Reviewer Title	Signature	Date	Comments
NEPA / Environmental Coordinator			
Authorized Officer			

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Additional Wildlife Information

Bald and golden eagles are protected by the Eagle Protection Act and are USFWS Birds of Conservation Concern. Bald eagles may winter in the project area between November 1 and March 15 and may occasionally fly over the area while foraging. Golden eagles have been noted both within and near the Sunrise project area. They are year round residents. No active golden eagle nests have been discovered within the CS Mining project area or, with limited survey effort, within about five miles, except for a potential nest located about two miles north in 2013. However, consistent sightings of both adult and juvenile golden eagles within the CS Mining project area suggest that golden eagles do nest in the vicinity. Golden eagles have been recently documented within the CS Mining project area in July 2013, February 2013, June 2012 and July 2011.

Bald eagles are wide ranging in the winter and there are no known roosts or concentration areas within the project area; therefore there would be no impact to bald eagles. Golden eagles would be impacted by a loss of foraging habitat. This impact cannot be quantified because it is unknown how close the mine is to eagle nests or roosts, or how often eagles hunt within the project area. The impact could vary from very minor to displacement of eagles to adjacent suitable habitat. The impact from the loss of foraging habitat would likely be minor as no eagle nests are known to occur within 0.5 mile of the proposed mine. Due to the presence of ongoing operations at both the CS Mining project and the nearby Rocky Range ballast mine, eagles in this area are probably habituated to mining disturbances such as people, haul trucks and blasting.

Burrowing owls have been documented within the general area, although none have been documented within the CS Mining project area. In 2013, one burrowing owl pellet was noted on a mound approximately 0.4 mile from the Sunrise Mine adit. It would be approximately 0.3 miles from the projected boundary of the Sunrise Pit and to the west on the other side of the low range of hills adjacent to the western boundary of the proposed pit. This range of hills rises about 300 feet above the alluvial plain.

While there may be burrowing owls in the vicinity, the only sign documented was about 0.3 mile from proposed disturbance and buffered from the proposed mining by a low range of hills. The recommended spatial buffer for burrowing owl nests is 0.25 mile. There should be no impact to burrowing owls from the Sunrise project.

Ferruginous hawk have also been documented in the general area. Multiple years of raptor nest surveys have not documented any ferruginous hawk nests within 0.5 mile of the Sunrise Project area. The closest known active nesting territory is about 3.6 miles from the Sunrise Project area. Other documented sightings of these hawks occur as close as 1.5 miles and some of these are likely within inactive territories.

The recommended spatial buffer for ferruginous hawk nests is 0.5 mile. There would be no impact to nesting ferruginous hawks since the nearest known occupied territory is about 3.6 miles away.

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Although these hawks may occasionally forage within the greater CS Mining project area, there are no impacts anticipated from the proposed Sunrise project.

The project area is suitable red-tailed hawk foraging habitat. One red-tailed hawk nesting territory has been documented at the edge of the 0.5 mile buffer of the proposed waste dump. It is a stick nest on a telephone pole adjacent to a dirt road. This nest was active in 2012, but gone in 2013. It is unknown if an alternate nest within the territory was used, but it would be likely.

Red-tailed hawk foraging habitat is abundant and the loss of habitat would likely not impact red-tailed hawks. These hawks are tolerant of disturbance and nesting activities would not be impacted by the proposed mining. There is no long term data on how frequently these hawks nest within 0.5 mile of the project location.

APPENDIX B

Design Features to Reduce Impacts

The CSM MOA project expansion would comply with all applicable Federal and State laws and local zoning ordinances. The Best Management Practices (BMPs) presented below and BLM's Standard Procedures Applied to Surface Disturbing Activities (BLM 1999: A1.1, A1.3-A1.4) would be utilized to minimize the potential for soil erosion and the introduction of non-native, invasive plant species on public lands. The following project design features and construction protocols are highlighted here as environmental protection measures (EPMs) that would be in effect throughout the MOA.

Air Quality

CSM received an Approval Order (DAQE-AN14219002-12), from the Utah Department of Environmental Quality, Division of Air Quality (DAQ), which is the authority for approving, issuing, and monitoring compliance of air quality permits in Utah. The Approval Order includes operating limits and opacity limits on visible emissions (i.e., fugitive dust) for each class of equipment and operation (i.e., hauling, crushing, conveying). The Approval Order addresses the air quality requirements for the MOA, which CSM will comply with by means of BMPs such as opacity monitoring, dust suppression via water and approved chemical application, and limiting crushing operations to non-windy days if necessary. If any changes were to occur in terms of air quality, CSM will notify all applicable agencies of the changes.

Soils

All haul roads would be designed with ditches and berms running along the edges of the road. This would help to minimize runoff and sediment transport to areas outside the designated disturbance areas. Additional BMPs used to minimize soil degradation include:

- Only clearing and grubbing areas as needed for additional disturbance
- Re-seeding topsoil stockpiles with an interim seed mix, as well as berming the area around the stockpiles to minimize runoff and sediment transport
- Controlling runoff and sediment transport throughout the MOA with features such as berms, ditches, turn-outs, and sumps

Water Quality

Seepage monitoring: water wells would be installed downgradient of any proposed tailings ponds, and would be checked daily for fluids. If fluids are found, then the monitoring plan would be initiated as per UDWQ ground water permit requirements.

Wildlife

CSM would comply with all Federal and State regulations in the mitigation of wildlife resources within the MOA. Mitigation efforts for the MOA would include the following:

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- The BLM and Utah Division of Wildlife Resources (UDWR) would be contacted to report injury or fatality of birds, active nests, or young (documented with a photo).
- Both project construction and operational staff would be trained on vegetation and wildlife avoidance and minimization techniques related to the project. Staff would also be provided with instruction on how to identify special status species. Project staff would be required to report direct impacts (e.g., vehicle collisions) to special status species to the BLM.
- Blasting would not occur when big game and other wildlife are within line of sight of the blasting area until the animals have moved through the area.
- Ground disturbing activities which require the removal of vegetation would occur outside of the nesting season; between July 16 - February 28. A variance to this stipulation may be granted in writing by the authorized officer upon the completion of a migratory bird survey using approved methodologies which provide 100% coverage of the area to be disturbed. If any active nests are located in areas of proposed disturbance, those active nests would be protected, with a 75 yard no disturbance buffer, until the young have fledged the nest.
- During the migratory bird breeding season (March 1-July 31) surveys would occur prior to any new disturbance to identify active raptor nests (within 0.5 mile radius of the project area).. If any active nests are located in areas of proposed disturbance, those active nests would be protected until the young have fledged the nest.
- Raptor management would be guided by the use of ‘Best Management Practices for Raptors and Their Associated Habitats in Utah’ (BLM 2006, Appendix C), utilizing seasonal and spatial buffers, as well as mitigation, to maintain and enhance raptor nesting and foraging habitat, while allowing other resource uses.
- The PLS pond, which has a maximum size of 2 acres, will be monitored daily by environmental staff and operational personnel for avian mortality. If avian mortality is observed, a mitigation plan will be developed by the CSM in conjunction with the BLM, UDWR, and USFWS to be approved in writing by the authorized officer within 120 days of the event.

Non-native Invasive Species and Noxious Weeds

A weed-free seed mix, approved by the BLM, would be used during reclamation activities. Periodic (twice yearly during the growing season) inspections for noxious weeds would be conducted during operations, closure, and reclamation, followed with approved control efforts when needed. Routine BLM inspections would monitor invasive species to ensure compliance with these requirements.

Stabilization and Rehabilitation

Topsoil would be scraped and stockpiled and conserved for revegetation efforts following mining operations. Interim seeding with an approved seed mixture would be conducted to discourage weed growth and erosion. All trash, refuse, and fuel/oil spills would be removed from the MOA and disposed of at an approved disposal site, such as the Beaver County Landfill.

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Livestock Protection

The integrity of any livestock gates, fence, cattle guards, and water pipes in the MOA would be maintained during mining activities.

Wildfire

All project personnel would have fire-fighting tools and extinguishers available at all times for use if the occasion arises. Project personnel would adhere to any BLM fire prevention requirements. Under BLM's Fire Management Plan, "All facilities, structures, or developments that are susceptible to fire damage will receive intensive suppression. The primary objective with this level of suppression is to prevent loss of life, property, or unacceptable resource damage."

Cultural Resources

All National Register of Historic Places (NRHP)-eligible cultural resources in the project area would be avoided or mitigated prior to disturbance. All mitigation plans would comply with all State and Federal regulations. At the discretion of the BLM archaeologist, an archaeological monitor would be present for any activities in the vicinity of NRHP-eligible sites. Although not anticipated, if previously undocumented cultural or historic objects are discovered during mining activities, the BLM Authorized Officer would be notified and work in the area would halt until documentation and evaluation by either the BLM archaeologist or a BLM-permitted archaeologist could be conducted.

Public Safety

Appropriate warning signs would be posted in locations where potential public access to the mining areas is adjacent and readily available, including at the guarded entrance road and blocked trails/roads. The activities within the MOA would not pose a threat to public health and safety because the active processing area and mine access would be controlled by a guard station, as well as being fenced and gated where applicable, and because the project is designed to manage risk with sound engineering, careful monitoring, and good management practices. The area would be signed (posted) to advise the public as to the existence of the mining operation, periodic blasting, and hazardous chemicals. These signs would be removed upon completion of reclamation when all hazards are removed.

Current pit slopes are designed to be mined in 1-2 lifts of 20 foot benches, with 25 foot catch benches every 60 vertical feet. Final slope angles would be 50-55 degrees. Slopes within the active pits would continue to be constructed at 50-55 degrees, as dictated by historic mining. CSM is in the process of developing a program for ongoing geotechnical evaluation of pit slopes in the Sunrise mine and would continue this program with future pit developments. The program would be carried out by licensed geotechnical engineers at IGES, Inc of Salt Lake City. The program would consist of geotechnical mapping, data analysis and modeling, and design recommendations for pit slopes with appropriate factors of safety for the various open pit segments. Meanwhile, slope stability monitoring would be ongoing for both the active pits.

Before blasting occurs, the blast foreman would sound a warning siren to alert all personnel of an impending blast; at which time all personnel and equipment would be removed from the blast zone. Before blasting, all roads that need to be blocked would be blocked in accordance with

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applicable regulations. Ammonium nitrate/fuel oil (ANFO) would be stored in accordance with applicable regulations, and blasting caps would be stored separately in a MSHA approved magazine.

The blasting foreman and aides would insure that all personnel have left the pit area, at which time all access roads that need to be blocked would be blocked. After five minutes time, two siren blasts, each one minute long, would be sounded. After an additional minute the blast foreman turns on his emergency flashing lights, sounds another three siren warnings, each thirty seconds long, and then the blast would be detonated. No one would enter the blast zone until the foreman checks the blast site and sounds the all-clear siren which would be one long siren blast. This protocol would be posted on access roads to the site to inform all visitors as to the blasting practices being utilized at the mine.

Hazardous Materials and Wastes

Dumpsters located on-site would contain all refuse. Refuse would be removed on a regular (weekly to bi-weekly) basis to an approved county landfill, such as the Beaver County Landfill.

CSM would comply with a Spill Prevention Control and Countermeasure (SPCC) Plan pursuant to 43 CFR 3809.401. Further, this SPCC Plan covers more than just the hydrocarbons addressed in the regulation; it also includes other substances of concern, including active solvents. All above ground tanks proposed for placement in the mine operations area would be double walled to prevent spillage or leaks. Any leaks from the primary tank shell would be fully contained within the outer tank shell. As part of normal work practice, any spills from mobile equipment would be promptly reported internally, per the SPCC Plan. Subsequently, CSM personnel would actively clean up any such spills and dispose of them appropriately according to applicable County, State, and Federal regulations.

CSM has on site an Emergency Response Plan to respond to spills of hazardous materials at the mine site, including solvents and diesel (SPCC 2013). The Emergency Response Plan is kept on-site in the mill office and truck shop. This plan describes the required level of containment and safety measures associated with storage, handling, and spill clean-up of materials that may include diesel, solvents, corrosives, and organic chemicals. Operations conducted in accordance with this plan would ensure that impacts from spills would be minimized and the spilled materials contained and removed. CSM has the necessary spill containment and cleanup equipment available on-site, and personnel would be able to respond quickly.

Runoff Features

There are no active streams within the project area. All surface water encountered during mining and operations would be handled in accordance to the best management practices (BMPs) set forth in CSM's storm water management plan (SWMP). Any additional runoff control features that would be constructed by CSM in relation to the MOA project expansion would be designed and maintained according to the SWMP.

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Reclamation Techniques

At the conclusion of the operations, all trash, oil, fuel, equipment, debris and structures would be removed from the MOA and the disturbed sites prepared for reclamation. Site preparation and revegetation activities would include:

- *Roads and parking areas*: ripping of hard/compacted surfaces, and grading to blend with adjacent surroundings. Topsoil would then be placed to an appropriate depth over the disturbed area, followed by seeding using an agency-approved seed mix.
- *Ore Stockpiles*: pushing/grading of remaining material to an appropriate configuration. Topsoil would then be placed to an appropriate depth over the disturbed area, followed by seeding using an agency-approved seed mix.
- *Open Pits*: backfilled portions of open pits would be ripped to a depth of 24 inches. Available topsoil would then be placed to an appropriate depth over the disturbed area, followed by seeding using an agency-approved seed mix.
- *Waste Dumps left at angle-of repose with terraces*: ripping to a depth of 24 inches on all terraces and dump tops/access ramps. Topsoil would then be placed to an appropriate depth over the ripped areas, followed by seeding the ripped areas using an agency-approved seed mix.
- *Waste Dumps pushed to an overall 3H:1V slope*: ripping dump slopes along dump contour, as well as dump tops/access ramps to a depth of 24 inches. Topsoil would then be placed to an appropriate depth over the disturbed area, followed by seeding using an agency-approved seed mix.

Termination

If the Project is to be terminated or abandoned, an inspection would be held with the BLM and UDOGM in order to agree upon an acceptable rehabilitation plan for the area. Successful reclamation would be determined by the BLM and UDOGM.

APPENDIX C

Existing Operations

Exploration

The exploration targets listed below are either currently permitted with UDOGM and the BLM, or are completely on private land.

Copper Ranch Exploration

The Copper Ranch Exploration is an extension of the existing UDOGM exploration permit E/001/0159 to the west of the Copper Ranch Knoll. The area is approximately 86 acres located in Section 17, T. 27 S., R. 11 W., SLB&M. The project area is located entirely on BLM lands. The initial drilling will consist of 8 drill holes on 200 foot centers, average depth at 400 feet. Depending on the drilling results, the project could be expanded up to 300 additional drill holes at the same approximate depth of 400 feet.

Candy B. Exploration

The Candy B. Exploration project is an area over the Candy B patented claim and continuing south onto BLM lands. The claim boundary is 34.09 acres with 23.45 acres located on BLM lands and 10.64 acres located on private patented lands. CSM currently has an approved UDOGM exploration permit E/001/0178 to drill 21 holes, 600-700 feet in depth, and 100 feet on center. The BLM has also approved the project under UTC01 3809: UTU-89128. The total exploration will have 142 drill holes, drill pads and roads. Drill pads will be 30 feet by 60 feet and roads will be 20 feet wide. The entire claim area will be disturbed by the exploration activity.

Hidden Treasure Exploration

The Hidden Treasure Exploration is an area west of the existing Hidden Treasure pit located in Sections 15, 16, 21 and 22, T. 27 S., R 11 W, SLB&M. The exploration area is approximately 29 acres with 4 acres on BLM and 25 acres on SITLA lands. CSM currently has an approved UDOGM exploration permit E/001/0187 to drill 9 drill holes, 400 feet in depth adjacent to the existing pit. BLM approval has also been received under UTC01 3809: UTU-90021. The 9 drill holes are on 50 foot centers. If ore resources are encountered, additional holes will be drilled to delineate the ore deposit on 200 foot centers with additional infield drilling to follow on 100 and 50 foot centers for pit modeling purposes.

Old Hickory Exploration

The Old Hickory Exploration is located near the Old Hickory mine that dates back to the early 1900s. The exploration area is located completely on private land. The area is approximately 11 acres in size. CSM is proposing to drill up to 100 drill holes, 200 to 600 feet in depth, to delineate additional ore resources.

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OK East Exploration

The OK East Exploration area is located north and east of the existing OK Mine in Section 7, T. 27 S., R 11 W., SLB&M. The exploration area is approximately 27 acres located completely on private land. CSM is proposing to drill 20 holes to explore for additional ore resources.

Niagara Hill Complex Exploration

The Niagara Hill Complex Exploration is included in the Bawana/Sunrise UDOGM exploration permit E/001/0172. The project area is north of the Bawana pit in Sections 14, 15, 22 and 23, T. 27 S., R. 11 W., SLB&M and is located entirely on private land. To date, 23 drill holes have been completed with an additional 80 drill holes planned to identify the mineral resource. After the exploration holes are completed, it is planned that a new pit will be developed to mine the ore.

Mining Activities

The mines listed below are currently permitted with the BLM and UDOGM for mining, with descriptions of the permitted activity outlined briefly. Currently, CSM conducts open pit mining in three pits: Hidden Treasure, Bawana, and Sunrise. Each pit has its own waste dump and topsoil stockpile. CSM utilizes such mining methods as drilling and blasting, loading material via loader or track hoe, and hauling material to their respective areas (waste dump or process facilities) with 60-ton or 100-ton haul trucks. CSM actively mines the approved pits 24 hours per day, seven days per week, for an average of 340 days per year. Detailed descriptions of the proposed reclamation methods for all currently permitted activities can be found in CSM's NOI (M/001/0067) with UDOGM.

Hidden Treasure Pit and Waste Dump

Under current approved plans, the Hidden Treasure Pit will be deepened to recover additional ore reserves; however, the disturbed area will remain at 25.00 acres (Figure 10a of the UDOGM NOI). An additional 1.8 million tons of waste material will be added to the waste dump which will increase the size of the dump post-reclamation to 72.21 acres (Figure 10b of the UDOGM NOI).

The waste rock will be added in lifts around the perimeter of the existing waste dump within the permitted acreage. Final reclamation will be done with a D-8 and D-10 Caterpillar (CAT), a CAT 385 Track Hoe and CAT 773B or CAT 777G Haul Trucks to slope the dump to the desired 3h:1v slope.

The Hidden Treasure disturbances will be reclaimed in accordance with the BLM and UDOGM's standards (Figure 10b of the UDOGM NOI). Because the waste rock dump will be constructed at the final outslope angle, only minor regrading will be necessary. The dump will be ripped to a depth of two (2) feet and topsoil will be distributed as available for reseeding. If additional topsoil or other materials can be found, the original 12.33 acres from prior operations will be reclaimed in the same manner; otherwise the area will only be ripped and reseeded.

Bawana Pit and Waste Dump

As currently approved, the Bawana Pit will be enlarged to recover additional ore reserves resulting in a total disturbance of 17.85 acres (Figure 11a of the UDOGM NOI). The pit will be

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extended to the northwest and approximately 2.3 million tons of overburden will be removed to allow 280,000 tons of ore to be mined. A portion of the overburden will be used to backfill the existing Bawana pit. The remainder of the waste will be placed over the existing dump. Topsoil in the dump expansion area will be stockpiled (Figure 11a of the UDOGM NOI). During final reclamation, the dump will be sloped and reclaimed in accordance with BLM and UDOGM standards (Figure 11b of the UDOGM NOI). The existing Bawana pit will be partially refilled during currently permitted activities, but will eventually be completely refilled with waste rock from the proposed Niagara pit. The expansion of the Bawana dump will result in a total disturbance of 39.47 acres. A 50-foot lift will be added to the existing Bawana dump from prior operations and expanded by adding additional lifts around the perimeter to achieve a 3h:1v slope within the permitted area. The lifts will be managed so the dump material and the topsoil stockpile areas will not be comingled. If sufficient growth media is not available, the waste in the pit would be ripped to a depth of two (2) feet and reseeded.

A 7.53-acre ore stockpile area has been established adjacent to the waste rock dump and across the haul road to the southeast (Figure 11a of the UDOGM NOI). Ore, primarily of lower grade, will be stockpiled here and hauled to the mill for blending with higher grade ore. The stockpile has been in use since prior operators mined the Bawana pit. Topsoil was not salvaged from the site and remains largely in place. After the stockpile is no longer needed and all ore is removed, the in-place soils will be ripped to an appropriate depth (approximately 1.5 times the soil thickness or 1 foot, whichever is greater) and then reseeded.

Sunrise Pit and Waste Dump

The approved Sunrise Pit is located primarily on patented land leased by CSM with its southern part extending onto BLM land. The pit encompasses an area of 12.46 acres (Figure 13a of the UDOGM NOI). Approximately 2.84 million tons of overburden and 577,400 tons of ore are anticipated to be removed from this pit. Ore will be hauled to the mill via a short haul road extending from the north side of the Sunrise Pit northward to the Hidden Treasure haul road near the Bawana pit. The overburden will be placed on the Sunrise waste dump, located east of the Sunrise Pit (Figure 13a of the UDOGM NOI). The Sunrise waste dump is located on a mixture of patented and unpatented land owned and/or controlled by CSM and will have an ultimate footprint of 41.23 acres. The waste dump will be designed and constructed to achieve a 3h:1v outslope.

The Sunrise disturbances will be reclaimed in accordance with the BLM and UDOGM's standards (Figure 13b of the UDOGM NOI). Because the waste rock dump will be constructed at the final outslope angle, only minor regrading will be necessary. Topsoil will be reapplied at a thickness of approximately one foot, ripped, and reseeded to all disturbed areas except the open pit itself.

Overburden to ore stripping ratio varies from pit to pit from approximately 3:1 to 9:1, depending on the individual pit and future economics. Highwall slopes will be constructed to acceptable ranges as delegated by UDOGM and the Mine Safety and Health Administration (MSHA).

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CSM Ore Characterization

The material mined from the MOA is primarily copper ore with lesser amounts of gold and silver. The Hidden Treasure, Bawana, and Sunrise copper deposits occur in bodies of garnet-magnetite skarn adjacent to quartz monzonite. These deposits form tabular zones of different orientations.

In 2012, metallurgical and mineralogical tests were performed on samples taken from the Hidden Treasure, Bawana, and Sunrise deposits. The results of these tests reaffirmed historical reports of low to non-existent amounts of pyrite (D. Hartshorn 2013). Copper in all three deposits is dominantly found in the oxide minerals malachite/azurite, cuprite, chrysocolla, and various copper-calcium silicates (ALS 2012a-c). Copper sulfide minerals, chalcopyrite, chalcocite, and bornite, occur in lesser quantities. The geology and mineralization in the Rocky Range is described in more detail in Chapter 3.

Samples representing waste rock (overburden), ore, and the pit bottom from the Bawana deposits have been characterized in terms of acid generation and neutralization potential (AGP and ANP, respectively). The results of that characterization testing are shown in **Table D-1**. The data indicate that all 8 overburden and pit bottom samples had a high neutralization potential and no acid-generating potential. All but 1 of the 8 ore samples had these same characteristics. Based on the proximity of the Bawana pit to the Hidden Treasure pit and the observations and experience by CSM with the geology and mineralization in each pit, the Acid Generating Potential/Acid Neutralizing Potential (AGP/ANP) data for the Bawana pit is reasonably representative of that for Hidden Treasure.

Table D-1 Bawana Mine Acid Base Analysis and Net Carbonate Data

Sample Description	Recvd Wt.	(C _T) C- IR07 C %	(S _T) S- IR08 S %	(C _R) C-IR07 C organic %	(S _R) S- IR08r S %	AGP	ANP	NCV	Result
Bawana OB1	0.22	1.2	0.03	0.08	<0.02	<0.01	4.11	<4.10	Moderately basic
Bawana OB2	0.20	1.17	0.04	0.23	0.04	0.00	3.45	3.45	Moderately basic
Bawana OB3	0.28	0.57	0.01	0.05	<0.02	<0.01	1.91	<1.92	Moderately basic
Bawana OB4	0.28	0.54	0.01	0.03	<0.02	<0.01	1.87	<1.89	Moderately basic
Bawana OB5	0.18	1.60	0.04	0.37	0.04	0.00	4.51	4.51	Moderately basic
Bawana OB6	0.18	0.80	0.01	0.08	<0.02	<0.01	2.64	<2.66	Moderately basic
Bawana OB7	0.14	0.65	0.03	0.04	0.02	-0.01	2.24	2.23	Moderately basic
Bawana OB8	0.10	3.04	0.57	0.08	0.59	0.03	10.86	10.89	Highly basic
Bawana Ore1	0.30	3.74	0.05	0.06	0.05	0.00	13.51	13.51	Highly basic
Bawana Ore2	0.34	0.38	0.03	0.08	<0.02	<- 0.01	1.10	<1.09	Moderately basic
Bawana Ore3	0.30	0.59	0.05	0.15	0.04	-0.01	1.61	1.60	Moderately basic
Bawana Ore4	0.36	0.75	0.03	0.12	<0.02	<- 0.01	2.31	<2.30	Moderately basic
Bawana Ore5	0.24	0.02	1.11	0.04	0.72	-0.53	-0.07	-0.61	Slightly acidic
Bawana Ore6	0.10	0.47	0.40	0.14	0.36	-0.05	1.21	1.16	Moderately basic
Bawana Ore7	0.08	3.12	0.02	0.04	<0.02	<0.00	11.30	<11.30	Highly basic
Bawana Ore8	0.10	2.44	0.03	0.04	0.02	-0.01	8.81	8.79	Highly basic
Bawana PB1	0.22	0.43	0.01	0.04	<0.02	<0.01	1.43	<1.45	Moderately basic
Bawana PB2	0.22	0.58	0.02	0.29	0.02	0.00	1.06	1.06	Moderately basic

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Sample Description	Recvd Wt.	(C _T) C- IR07 C %	(S _T) S- IR08 S %	(C _R) C-IR07 C organic %	(S _R) S- IR08r S %	AGP	ANP	NCV	Result
Bawana PB3	0.22	0.48	0.02	0.15	<0.02	<0.00	1.21	<1.21	Moderately basic
Bawana PB4	0.30	0.87	0.01	0.03	<0.02	<0.01	3.08	<3.10	Moderately basic
Bawana PB5	0.14	0.99	0.01	0.13	<0.02	<0.01	3.16	<3.17	Moderately basic
Bawana PB6	0.20	1.97	0.01	0.05	<0.02	<0.01	7.05	<7.06	Highly basic
Bawana PB7	0.10	0.96	0.02	0.03	<0.02	<0.00	3.41	<3.41	Moderately basic
Bawana PB8	0.16	0.22	0.02	0.03	<0.02	<0.00	0.70	<0.70	Slightly basic

OB = overburden

PB = Pit bottom

NCV = Net Carbonate Value

CSM has obtained AGP/ANP data for representative samples of overburden, wall rock, and pit floor for the Sunrise deposit. The results are summarized in **Table D-2**.

Table D-2 Acid Generating and Neutralization Potential – Sunrise Deposit

	MPA	NP	pH	Ratio (NP:MPA)
Units	tCaCO3/1000t ore	tCaCO3/1000t ore	Unity	Unity
SAMPLE				
OB Composite 1	2.2	479	7.9	219
OB Composite 2	1.9	405	7.7	216
OB Composite 3	5	541	7.6	108.2
OB Composite 4	1.9	405	7.8	216
OB Composite 5	1.6	430	8	275.2
OB Composite 6	1.6	572	8.1	366.1
OB Composite 7	2.2	375	7.7	171.45
PB Composite 1	13.1	671	9.8	51.12
PB Composite 2	4.4	387	9.1	88.46
PB Composite 3	4.1	286	8.7	70.4
PB Composite 4	2.2	148	8.7	67.66
PB Composite 5	2.8	262	8.7	93.16
PB Composite 6	2.2	239	8.4	109.25
PB Composite 7	1.9	183	8.6	97.6
PB Composite 8	2.2	274	8.8	125.25
WR Composite 1	0.9	182	8.8	194.15
WR Composite 2	1.6	200	9.8	128
WR Composite 3	0.6	163	8.9	260.8
WR Composite 4	0.9	182	8.7	194.15
WR Composite 5	1.3	279	9.3	223.2
WR Composite 6	2.5	328	8.6	131.2
WR Composite 7	1.6	172	8.9	110.1
WR Composite 8	1.6	312	8.6	199.7
OZ Composite 3	14.1	679	8.3	48.28
OZ Composite 4	15.3	599	8.4	39.12
OZ Composite 5	7.2	762	8.9	106
OZ Composite 6	30.3	627	8.8	20.68

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	MPA	NP	pH	Ratio (NP:MPA)
Units	tCaCO3/1000t ore	tCaCO3/1000t ore	Unity	Unity
OZ Composite 7	1.9	114	8.4	60.8
OZ Composite 8	21.6	401	10	18.6
OZ Composite 9	15.3	577	7.8	37.68
OZ Composite 10	2.5	658	8.9	263.2
WT Composite 1	8.4	718	8.8	85.1
WT Composite 2	11.3	591	9.3	52.53
MPA: Maximum Potential Acidity				
NP: Neutralization Potential				

OB means overburden (cemented alluvium) PB means pit bottom

WR means wallrock

OZ means ore zone

WT means waste rock

The AGP/ANP data for the Sunrise deposit demonstrate that the waste rock, pit floor, and wall rock in the proposed pit will be non-acid-generating and will have excessive neutralizing potential. Acid rock drainage is therefore not anticipated in either the waste rock dump or the pit.

Processing Facilities

CSM currently has processing facilities in place with the capability of crushing, grinding, and flotation of the copper and magnetite ore. These facilities are located completely on private land north of the existing pits, on the southern foothills of the Beaver Lake Mountains. CSM has also received approval from UDOGM to expand current facilities to include an acid leach and solvent extraction/electrowinning (SX/EW) circuit. Currently all approved process facilities are/will be located on 96.3 acres of private land. All access to CSM operations is controlled and restricted by warning signs, security guards, fences, and gates. CSM process facilities operate 24 hours per day, seven days per week. The facilities are closed for approximately one month out of each year for maintenance work, for an average of 340 operational days per calendar year.

Active Crushing, Grinding, and Flotation Process Area

The primary process area consists of a crushing and grinding area with a dirt/gravel floor, and a flotation mill and recovery station with a concrete floor. The entire facility has underlying concrete footings. The facility also includes chemical storage and conditioning tanks, and a lined flotation pond in the southern end of the facilities area.

The concentrating procedures start with primary crushing of the ore with jaw crushers, and secondary crushing with cone crushers. The ore is then sent to a series of ball mills for further grinding followed by a rough magnetic separation which separates the magnetite ore from the copper. The magnetite concentrate is stockpiled in anticipation of its sale to an end user. The copper ore proceeds to the conditioning, reagent, and mixing circuit of flotation and filtration, which results in a copper concentrate and tailings. The copper concentrate is stockpiled for later shipping via truck to offsite facilities for further processing. The tailings are deposited in the flotation tailings pond south of the facilities.

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Acid Leach and Solvent Extraction/Electrowinning (SX/EW)

The acid leach circuit and solvent extraction/electrowinning facilities have been approved by UDOGM (UDOGM 2014). After the acid leach circuit and related facilities are built, the tailings from the flotation circuit will be transported via pipeline to the acid-leach/counter-current decantation (CCD) circuit where it will undergo leaching with sulfuric acid solution. The resultant copper-bearing pregnant leach solution (PLS) will be processed in the adjacent SX/EW circuit. All solutions used in the processing of copper ore will be recycled back through the system. Residual solids remaining after each of the extraction steps are recovered and sent to tailings. Most of the solids, termed crud, are recovered by filtration activities at the SX circuit. Design drawings for the acid leach and SX/EW facilities can be found in Appendix F of the UDOGM NOI.

Deleterious or Acid-forming Materials

CSM will be using sulfuric acid in its acid leach circuit and for stripping copper from the solvent prior to electrowinning. Two large sulfuric acid tanks will store acid used in the process. Secondary containment for this facility will have the capacity to contain 110 percent of the total volume of the largest tank. Appropriate spill containment will be provided in all mill facility components that use sulfuric acid.

The solvent extraction circuit will use a kerosene-based organic mixture to separate copper and trace metals from the acid solution that is recovered by the CCD circuit. All chemicals will be handled properly in accordance with guidance provided by the manufacturer. Process solvents will be kept in an isolated location within the fully contained mill, and inadvertent spills will be fully contained within the concrete mill foundation. Any spills will be immediately cleaned up, again in accordance with manufacturers' guidelines. Acid-forming materials are not expected to be encountered during the mining operations.

A detailed chemical spill prevention, control and countermeasures (SPCC) plan is kept onsite at all times. Monitoring of all containments occurs regularly, with any degradation in containment reported immediately. All employees have been trained on the type of materials used in the beneficiation operations, and what actions to take in case of accidental exposure.

CSM stores motor fuel (diesel) on site. Most of the fuel is stored in the tanks at the offsite truck shop. A single 2500 gallon diesel fuel tank is located at the mill. It is contained within an earthen berm lined with a 40-mil HDPE membrane.

Tailings Facilities

Flotation Tailings Pond

The flotation tailings pond is located south and down-gradient of the process facilities. The pond is lined and fenced, and encompasses a footprint of approximately 30 acres of private land. The flotation tailings pond currently receives tails from the flotation milling process outlined above. Upon completion of the acid leach circuit, the flotation tails will be extracted from the existing tailings pond and sent through the leach/SX/EW circuit to recover the remaining copper that was not extracted during flotation processes.

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Intermediate Tailings Disposal Facility

The construction and use of an Intermediate Tailings Disposal Facility (ITDF) is included in the approval issued by UDOGM (UDOGM 2014). The ITDF will be located on private land, encompassing 85.1 acres within two small canyons east of the facilities area. The ITDF will have two dams and a capacity of approximately 5 million cubic yards, with an anticipated life of four to eight years. Containment of tailings liquids will be accomplished by one or more of the following: selective distribution of tailings fines to retard infiltration at the bottoms of the impoundment, by collection of infiltrated water using “pump-back” wells installed below the toes of the dams, and/or with geosynthetic clay liner (GCL). At a minimum the upstream faces of both dams will be lined with GCL. The ponds will be designed to contain all un-diverted upland runoff from an appropriate precipitation return event.

Reclamation of the ITDF will be accomplished by first placing a geotextile as needed for foundation stability on top of the partially dried tailings surface and then advancing a one-foot topsoil and geotextile sequentially across the pond surface. Topsoil will be scarified after placement and reseeded by broadcast methods using the Division-approved seed mix. A detailed description of the proposed reclamation activities for the ITDF can be found in CSM’s NOI.

Monitoring Wells

CSM has a ground water discharge permit from the Utah Division of Water Quality (UDWQ) under Permit Number UGW010014 (UDWQ 2014). This ground water discharge permit covers the mining and processing activities and tailings ponds described in Section 2.2 of this EA. CSM currently has four monitoring wells associated with the flotation tailings pond, and two down-gradient monitoring wells associated with the ITDF. Additional down-gradient sampling for the ITDF is taken from the WW-6 production well. Upgradient monitoring of the ITDF is done by sampling the WW-3 production well.

Ancillary Facilities

Access and Traffic

The MOA is accessed by driving west from Milford, Utah along Highway 21, then northwest on an unnamed dirt road. There exists a guard station along the unnamed dirt road that controls all traffic entering and exiting the active CSM mining property.

APPENDIX D

Wildlife Report

Affected Environment

The project area is generally semi-arid, high-desert country characterized by dissected hills of relatively low relief surrounded by valley flats. The project area is located between 5,200 and 5,800 feet elevation above mean sea level in an area with flats dominated by big sagebrush (*Artemisia tridentata*) and the hills/mountains dominated by black sagebrush (*Artemisia nova*). Sagebrush provides important winter habitat for several wildlife species (e.g., mule deer and pronghorn) and localized habitat for sagebrush-obligate species (e.g., pygmy rabbit and Brewer's sparrow). Sagebrush also provides important breeding, nesting, and brood-rearing habitat for these species and others.

General wildlife observations were made along with surveys for raptors and bats, conducted in the project area on several occasions during 2013 (JBR 2013) and 2014 (JBR 2014). This section describes the results of raptor and bat surveys, and also describes big game and other potential wildlife in the area.

The following animals (Table 3.3-2) were observed within or directly adjacent to the project area:

Table 3.3-2: Animals Observed During Survey

Common Name	Scientific Name
Black-tailed jackrabbit	<i>Lepus californicus</i>
Coachwhip	<i>Masticophis flagellum</i>
Common side-blotched lizard	<i>Uta stansburiana</i>
Desert cottontail	<i>Sylvilagus auduboni</i>
Desert horned lizard	<i>Phrynosoma platyrhinos</i>
Desert spiny lizard	<i>Sceloporus magister</i>
Gopher snake	<i>Pituophis catenifer</i>
Great Basin collared lizard	<i>Crotaphytus bicinctores</i>
Long-nosed leopard lizard	<i>Gambelia wislizenii</i>
Whiptail	<i>Aspidoscelis tigris</i>
White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>

Two coyote (*Canis latrans*) dens were noted as active during a 2013 biological survey (JBR 2013), these dens were checked during the 2014 survey and found to be inactive.

Raptors

Special habitat needs for raptors include nest sites, foraging areas, and roosting or resting sites. Buffer zones are usually recommended around raptor nest sites during early spring and summer when raptors are raising their young. The most utilized raptor nesting areas are generally found along riparian areas and cliff faces.

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Sixty large stick nests, suitable for use by raptors, were found/checked (JBR 2014) within the general raptor and golden eagle survey areas, which included the Rocky Range Mountains, the southern portion of the Beaver Lake Mountains, and the northern portion of the Star Range. Of the nests found/checked 10 were active, 6 with raptor species and 4 being used by ravens.

Bald and golden eagles are protected by the Bald and Golden Eagle Protection Act and are United States Fish and Wildlife Service (USFWS) Birds of Conservation Concern. Bald eagles may winter in the project area between November 1 and March 15 and may occasionally fly over the area while foraging. Golden eagles have been noted both within and near the project area. They are year round residents. Three active golden eagle nests have been discovered within the five-mile buffer of the MOA. There are consistent sightings of both adult and juvenile golden eagles within the MOA that further supports that golden eagles do nest in the vicinity (JBR 2014).

Of three active golden eagle nests identified during the 2014 survey (JBR 2014), two were successful and fledged chicks. Nest UT040002012 at the extreme north end of the survey area fledged two chicks. Nest UT040002020 at the extreme south end of the survey area fledged at least one chick and possibly two. Due to the nest location, extremely high on a rock face, and the depth of the nest, it was very difficult for surveyors to achieve a vantage point to see into the nest. One nest (UNK_012) failed. An eagle pair was observed improving this nest by surveyors during early spring, and a subsequent visit to the nest later in the 2014 nesting season confirmed a golden eagle incubating at the site. A final return visit to the nest for the purpose of verifying nesting success found the nest to be prematurely vacated. Surveyors were able to get higher than the nest and utilizing a spotting scope to see into the nest; there was no evidence of adult eagles or chicks in or near the nest. No deceased chicks were found in or under the nest, rather the nest was confirmed to be completely empty. The failed golden eagle nest was located very close to a common raven nest and during every previous visit to the nest ravens were observed harassing the nesting golden eagles.

Burrowing owls have been documented within the general area, although none have been documented within the MOA. In 2013, one burrowing owl pellet was noted on a mound approximately 0.4 mile from the Sunrise Mine adit.

Ferruginous hawk have also been documented in the general area. Multiple years of raptor nest surveys have not documented any ferruginous hawk nests within 0.5 mile of the Project Area until the 2104 survey when a ferruginous hawk nest was identified in a power line structure next to the Marietta Mine crusher yard. This nest was active and fledged chicks.

The project area is suitable red-tailed hawk foraging habitat. One red-tailed hawk nesting territory has been documented within the 1-mile buffer of the MOA. It is a stick nest on a power line structure adjacent to a dirt road. This nest was active in 2012, but gone in 2013. It is unknown if an alternate nest within the territory was used, but it would be likely.

Several raptor individuals (unassociated with nests) were seen during the general raptor survey event; two ferruginous hawks were seen courting and copulating near the edge of the 1-mile buffer survey area boundary but no nest was located in or near the survey area. Several

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American kestrels were also noted flying through the survey area but none were found to be nesting within the survey area. Prairie falcons were observed flying over the project area and two active prairie falcon nests were discovered well outside the 0.5-mile buffer.

Bats

There are four locations noted in or near the project area that have potential to contain bats. These locations include the old Sunrise adit, the Montreal adit, the Old Hickory 100 Level adit, and the Niagara adit. During field reconnaissance, it was noted that the Montreal adit had been covered, and no sign of activity was present (JBR 2014). For the other three locations, an AnaBat Detector was used to passively survey for bat species in 2013 and 2014 (see JBR 2013 and 2014). In 2014, the more active and recent year, at the Sunrise adit, a total of 952 bat calls over 6 species were recorded during the spring monitoring period and 1,160 calls over 7 species were recorded for the fall period. At the Old Hickory mine, a total of 116 calls were recorded over 7 species during the spring survey while the fall survey produced 451 calls over 10 species. At the Niagara adit, a total of 211 bat calls were recorded over 11 species during the spring survey and 411 calls over 6 species during the fall survey.

Of the bat species detected, only the Townsend's big-eared bat (*Corynorhinus townsendii*) and the fringed myotis (*Myotis thysanodes*) are considered special status species (BLM sensitive). The Townsend's big-eared bat was detected on the recordings at both the Niagara and Old Hickory adits only during the fall acoustical monitoring while the fringed myotis was only detected at the Niagara adit, during the spring acoustical monitoring (JBR 2014). Fringed Myotis are present based on only two call sequences identified to this species; it is possible these two sequences are a different species, but due to their conservation status they were included.

Migratory Birds

Migratory birds are important components of biological diversity and indicators of environmental conditions at local, regional, and global scales. A variety of migratory birds are found in the project area. The most commonly occupied breeding habitat for migratory birds in the project area is sagebrush shrub steppe. A complete list of birds noted during the survey is located in **Table 3.3-3**.

Table 3.3-3: Birds Observed During the Survey

Common Name	Scientific Name
American kestrel	<i>Falco sparverius</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Black-throated sparrow	<i>Amphispiza bilineata</i>
Brewer's sparrow	<i>Spizella breweri</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Chukar	<i>Alectoris chukar</i>
Common raven	<i>Corvus corax</i>
Ferruginous hawk	<i>Buteo regalis</i>
Golden eagle	<i>Aquila chrysaetos</i>
Horned lark	<i>Eremophila alpestris</i>
Lesser nighthawk	<i>Chordeiles acutipennis</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Long-eared owl	<i>Asio otus</i>

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Common Name	Scientific Name
Northern flicker	<i>Colaptes auratus</i>
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>
Prairie falcon	<i>Falco mexicanus</i>
Rock wren	<i>Salpinctes obsoletus</i>
Sage sparrow	<i>Amphispiza belli</i>
Sage thrasher	<i>Oreoscoptes montanus</i>
Turkey vulture	<i>Cathartes aura</i>
Western kingbird	<i>Tyrannus verticalis</i>
Western meadowlark	<i>Sturnella neglecta</i>

Big Game

The project area is not in crucial winter range for mule deer or range for elk. However, it is within a large area that has been mapped by the Utah Division of Wildlife Resources as crucial yearlong pronghorn habitat (BLM 2013a). The mapped habitat covers the valleys of the western deserts of Utah from Iron County to southern Box Elder County. Pronghorn are speedy ungulates that occur in open, dry habitats. In Utah, nearly all pronghorn populations occur in shrubsteppe containing large expanses of open, low, rolling, or flat terrain (UDWR 2009). The project area is located within the Southwest Desert Herd Management Area, which contains about 2 million acres of crucial yearlong habitat. The herd unit is below the population objective (BLM 2013b). The site characteristics provide suitable habitat: open country with sagebrush and perennial grasses and forbs. The project area is not known to be important for pronghorn fawning or wintering. Pronghorn use of the project area appears to be limited due to low population numbers in this portion of the unit, limited species distribution in the area, and levels of human disturbance (BLM 2013a).

Threatened, Endangered, Candidate, or Sensitive Animal Species

Table 3.3-4 lists all special status animal species occurring in the Cedar City Field Office planning area. Prior to conducting surveys, 10 special status species were identified that have a moderate to high probability of occurring within or adjacent to the project area: bald eagle, burrowing owl, ferruginous hawk, big free-tailed bat, fringed myotis, kit fox, pygmy rabbit, spotted bat, Townsend's big-eared bat, and Western red bat. Other species would not be found in the survey area due to lack of suitable habitat. Details about their habitat are listed in **Table 3.3-4**.

Table 3.3-4: Special Status Species Known or Potentially Occurring in the MOA

Common Name	Scientific Name	Habitat Requirements	Probability of Occurrence in the project area	Status
FISH				

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Common Name	Scientific Name	Habitat Requirements	Probability of Occurrence in the project area	Status
Bonneville cutthroat trout	<i>Oncorhynchus clarkii utah</i>	One of three subspecies of cutthroat native to Utah. It occurs in streams and lakes of the Bonneville Basin and a limited portion of the Virgin River Drainage (Bosworth 2003). In general, habitat is variable, ranging from high elevation streams with coniferous and deciduous riparian trees to low elevation streams in sage-steppe grasslands containing herbaceous riparian zones. Regardless of habitat, require a functional stream riparian zone that provides structure, cover, shade, and bank stability.	None - No suitable aquatic habitats within the Milford Operations Area.	BLM Sensitive, Conservation Agreement Species, Utah Species of Concern
Desert sucker	<i>Catostomus clarkii</i>	In Utah, the species occurs only in the Virgin River system in the southwestern corner of the state.	None - No suitable aquatic habitats within the Milford Operations Area.	BLM Sensitive, Utah Species of Concern
Southern leatherside chub	<i>Lepidomeda aliciae</i>	Endemic to streams in the southern and eastern Bonneville Basin. Require flowing water and do not persist in lakes or reservoirs. Occupied streams have a high variability of stream flow, annual precipitation, gradient, elevation, conductivity, and pH (Utah Division of Wildlife [UDWR] 2010).	None - No suitable aquatic habitats within the MOA.	BLM Sensitive, Utah Species of Concern, Conservation Agreement Species
AMPHIBIANS				
Arizona toad	<i>Bufo microscaphus</i>	In Utah, found only in the southwestern portion of the state. This species inhabits streams, washes, irrigated crop lands, reservoirs, and uplands adjacent to water.	None - No suitable aquatic habitats within the MOA.	SS
Western (boreal) toad	<i>Bufo boreas</i>	Primarily found in or near ponds, lakes, reservoirs, rivers, and streams within grasslands and mountain meadows (Stebbins 1985).	None - No suitable aquatic habitats within the MOA.	CA
BIRDS				
American white pelican	<i>Pelecanus erythrorhynchus</i>	In Utah, the only known breeding colonies are located in the northern portions of Utah, Utah Lake and Great Salt Lake ecological complex. During spring migration, the breeding season, and fall staging and migration periods, can be observed at many reservoirs throughout the state.	None - No suitable aquatic habitats within the MOA.	BLM Sensitive, Utah Species of Concern

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Common Name	Scientific Name	Habitat Requirements	Probability of Occurrence in the project area	Status
Bald eagle	<i>Haliaeetus leucocephalus</i>	Occur in Utah generally on a migratory or wintering basis, although a small population nests in Utah. Nests in tall trees and commonly near bodies of water where prey are available. Bald eagles will feed on fish, waterfowl, small mammal, and carrion. Will concentrate wherever food is available, roosting in large groups in forested stands that provide protection from weather. They may also winter in upland habitats, feeding on small mammals and deer carrion.	Moderate - No lakes or reservoirs occur within or near the MOA. Potential foraging habitat.	BLM Sensitive, Utah Species of Concern
Black swift	<i>Cypseloides niger</i>	Use waterfalls for nesting; typically falls that are permanent but may be intermittent if they flow throughout the breeding season (June to early September). Nesting sites are typically coniferous forests, often mixed conifer or spruce-fir forests, but this varies depending on elevation and aspect. Nest sites may include mountain shrub, aspen, or even alpine components.	None - There are no waterfalls or bodies of water in or near the MOA.	BLM Sensitive, Utah Species of Concern
Burrowing owl	<i>Athene cunicularia</i>	Nests occur in shrub-dominated habitats, including sagebrush steppe and desert scrub, often in sparsely vegetated areas with a short grass herbaceous component (Bosworth 2003). Are obligate burrow nesters and may be largely dependent on prairie dog burrows in much of Utah, but also utilize burrows dug by badgers, ground squirrels, and other burrowing rodents.	High - Shrub dominated habitats present. Suitable burrows likely present. Known occurrences in the area.	BLM Sensitive, Utah Species of Concern
California condor	<i>Gymnogyps californianus</i>	Mountainous country especially rocky and brushy areas with cliffs; forage over large areas. Species is concentrated in southern Utah, in the region of the Grand Canyon and Zion Canyon.	Low - Foraging habitat is present and birds have been documented in region. MOA is about 70 miles from known condor roosting locations.	Federally Listed Endangered west of Interstate 15
Ferruginous hawk	<i>Buteo regalis</i>	Occupy grasslands, sagebrush, salt-desert, and other shrublands, and edges of pinyon-juniper woodlands; they may become locally abundant at shrubsteppe and pinyon-juniper ecotones. They may occur as breeding or year around populations in southwest Utah.	High - Suitable habitat present throughout most of the MOA. Known occurrences in the area.	BLM Sensitive, Utah Species of Concern
Greater sage-grouse	<i>Centrocercus urophasianus</i>	Inhabit sagebrush plains, foothills, and mountain valleys. Sagebrush is the predominant plant of quality habitat. A good understory of grasses and forbs, and associated wet meadow areas, are essential for optimum habitat.	None - MOA is located approximately 8.5 miles outside of Utah Division of Wildlife Resources (UDWR) mapped habitat.	Federal Candidate, BLM Sensitive

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Common Name	Scientific Name	Habitat Requirements	Probability of Occurrence in the project area	Status
Lewis' woodpecker	<i>Melanerpes lewis</i>	Habitats are burned-over Douglas-fir, mixed conifer, pinyon-juniper, riparian, and oak woodlands, but is also the fringes of pine and juniper stands, and deciduous forests, especially riparian cottonwoods (ibid.). Areas with an under-story of grasses and shrubs to support insect prey populations are preferred. Dead trees and stumps are required for nesting.	Low - There are no deciduous forests located in or near the MOA. May use MOA during migration.	BLM Sensitive, Utah Species of Concern
Long-billed curlew	<i>Numenius americana</i>	Use expansive, open, level to gently sloping or rolling grasslands with short vegetation such as shortgrass or recently grazed mixed-grass prairie. They commonly nest in both wet and dry prairie and in pastures, but rarely nest in hayland, cropland, fallow, or stubble fields (Dechant et al. 2003).	Low - No known occurrences in the MOA. The species has been documented as a breeder in region.	BLM Sensitive, Utah Species of Concern
Northern goshawk	<i>Accipiter gentiles</i>	Inhabit montane coniferous and deciduous woodland in the west, nesting in stands of intermediate to high canopy-closure with a thin understory, interspersed with small openings, fields, or wetlands. Important microhabitats in Utah include snags, multiple canopies, and down woody debris. In southern Utah, most often associated with mature to old growth stands of Engelmann spruce (<i>Picea engelmannii</i>) and subalpine fir (<i>Abies lasiocarpa</i>), followed by aspen (<i>Populus tremuloides</i> ; Graham et al. 1999).	Low - The MOA provides forested habitats, but lacks multiple canopies and intermediate to high canopy-closure. No known occurrences.	BLM Sensitive, Conservation Agreement
Short-eared owl	<i>Asio flammeus</i>	Short-eared owls are ground nesters, generally in grasslands and tundra. Nesting habitat has been described in Utah as marshes; wet hummocks; agricultural croplands; arid grassland; sometimes cold desert shrub (including saltbush and greasewood), and sagebrush-rabbitbrush (Bosworth 2003).	Low - No known occurrences in the MOA.	BLM Sensitive, Utah Species of Concern
MAMMALS				
Big free-tailed bat	<i>Nyctinomops macrotis</i>	Prefers rocky and woodland habitats, where roosting occurs in caves, mines, old buildings, and rock crevices. In Utah the big free-tailed bat has been captured in the following habitats: lowland riparian, desert shrub, and montane forest (Oliver 2000).	Moderate - Woodland habitat present and known to occur in region.	BLM Sensitive, Utah Species of Concern
Dark kangaroo mouse	<i>Microdipodops megacephalus</i>	In Utah, the species occurs in the West Desert, typically in sagebrush areas with sandy soils.	None - Suitable, sandy soils not present in the MOA.	BLM Sensitive, Utah Species of Concern

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Common Name	Scientific Name	Habitat Requirements	Probability of Occurrence in the project area	Status
Fringed myotis	<i>Myotis thysanodes</i>	Moderately wide range of habitats: lowland riparian, desert shrub, juniper-sagebrush, sagebrush-rabbitbrush, pinyon-juniper-sagebrush, pinyon-juniper, mountain meadow, ponderosa pine forest, and montane forest and woodland. Inhabits caves, mines, and buildings (Oliver 2000).	Moderate - Suitable habitat present in the MOA.	BLM Sensitive, Utah Species of Concern
Kit fox	<i>Vulpes macrotis</i>	Habitats include desert, grassland/herbaceous, playa/salt flat, savanna, shrubland; primarily in open desert, shrubby or shrub-grass habitat. In the Great Basin it is found in shadscale, greasewood, and sagebrush (NatureServe 2010).	Moderate - The MOA contains sagebrush and open desert.	BLM Sensitive, Utah Species of Concern
Pygmy rabbit	<i>Brachylagus idahoensis</i>	Habitats are dominated by big sagebrush and on alluvial fans where sagebrush occurs in tall, dense clumps (Green and Flinders 1980). Burrows are usually located at the base of sagebrush plants. Diet consists primarily of big sagebrush species; however, grasses and forbs are utilized in the summer.	Moderate - The MOA contains big sagebrush and soils suitable for creating burrows. No known occurrences.	BLM Sensitive, Utah Species of Concern
Spotted bat	<i>Euderma maculatum</i>	Inhabit a diversity of habitats: grass, desert, pinyon/juniper, sagebrush, and ponderosa up to high elevation coniferous forests, and also riparian and urban high-rise (cliff analog). Foraging occurs over sagebrush steppe, desert scrub, or montane meadow habitat. It is thought that spotted bats roost singly in steep cliff faces having cracks or crevices, but there is some indication that caves and mines may be used in winter (Altenbach et al. 2002).	Moderate - Roosting and foraging habitat present in the MOA.	BLM Sensitive, Utah Species of Concern
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Dependent on deep caverns or mines for roost, maternity, and hibernation sites. Use variety of grassland/shrub and forested habitats, primarily pinyon-juniper-mahogany, white fir, blackbrush, sagebrush, salt desert scrub, and agricultural and urban habitats (Altenbach et al. 2002).	High - Adits and mine shafts present in the MOA. Known occurrences in the MOA.	BLM Sensitive, Utah Species of Concern
Utah prairie dog	<i>Cynomys parvidens</i>	Burrowing mammals that require the presence of well-drained soils. Inhabit areas where vegetation can be maintained at a height level, which allows them to identify invading predators. Prefer areas where less than 10% of the vegetation is composed of tall plants greater than 12 inches (Collier 1975).	None - The MOA is outside the known range and outside Designated Critical Habitat.	Federal Threatened
Western red bat	<i>Lasiurus blossevillii</i>	Found near water, often in wooded areas.	High - Suitable habitats and known occurrences in the MOA.	BLM Sensitive, Utah Species of Concern

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Environmental Consequences

A total of 1,225 acres would be disturbed under the Proposed Action; 140 acres for exploration and 1,085 acres for mine expansion and associated facilities.

Human activity and disturbance would be new in the Big Wash and Crossroads exploration areas, as there are no existing mining activities occurring in those areas. However, overall impacts to wildlife from exploration activities would be negligible to minor and short term. Habitat, 140 acres total, would be temporarily impacted from drilling activities under the Proposed Action. The disturbance at the drill locations would be reclaimed and re-seeded after drilling and thus would be a short-term loss. Suitable habitat is abundant and available adjacent to the project area. Minimal indirect effects to some small, less mobile individuals would likely occur as they could be forced to disperse from the area or may be killed or injured during exploration activities. Wildlife in the area would likely be displaced temporarily during active drilling activities into adjacent undisturbed habitat. Populations on the whole would not be affected.

In areas of existing mining activities, wildlife has likely been displaced or habituated to the noise and activity. Although mine activities would be expanded onto adjacent lands, overall impacts to wildlife in these areas would also be negligible to minor, but long term (for the life of the project). Reclamation would occur concurrently with mining; an expended pit would be reclaimed as mining at another pit commenced, therefore not all 1,085 acres of habitat would be impacted at once.

Raptors

Bald eagles are wide ranging in the winter and there are no known roosts or concentration areas within the project area; therefore there would be no impact to bald eagles.

Golden eagles would be impacted by a loss of foraging habitat. The impact could vary from very minor to displacement of eagles to adjacent suitable habitat. The impact from the loss of foraging habitat would be minor. Due to the presence of ongoing operations at both the CSM project and the nearby Rocky Range ballast mine, eagles in this area are probably habituated to mining disturbances such as people, haul trucks, and blasting.

Red-tailed hawk foraging habitat is abundant and the loss of habitat would likely not impact red-tailed hawks. These hawks are tolerant of disturbance and nesting activities would not be impacted by the Proposed Action.

Any raptor could be attracted to the mining and haul road areas to scavenge road kill. If this occurred, they could be hit by haul trucks. However, BLM is unaware of road kills within the MOA, except for an occasional snake.

Raptor management would be guided by the use of 'Best Management Practices for Raptors and Their Associated Habitats in Utah' (BLM 2006, Appendix C), utilizing seasonal and spatial buffers, as well as mitigation, to maintain and enhance raptor nesting and foraging habitat, while allowing other resource uses.

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The application of spatial and seasonal/timing buffers would follow guidance in BLM (2006), and specifically depend upon the type and duration of activity proposed to take place within the buffer as well as the distance and visibility of the activity from the active nest site. An activity report would be provided to the BLM during this time frame. BLM (2006) states that “land managers should evaluate the type and duration of the proposed activity, the position of topographic and vegetative features, the sensitivity of the affected species, the habituation of breeding pairs to existing activities in the proposed project area, and the local raptor nesting density, when determining site-specific buffers.” If longer term activities such as those involving mine operations are proposed within a spatial and seasonal buffer for an active nest, perennial surface occupancy restrictions may be advised.”

Bats

Bats can be very sensitive to human disturbance and sound, causing them to abandon roosts, including maternity colonies and hibernacula. Disturbances during winter may cause bats to wake up, or come out of torpor, expending additional calories which can cause death. Several of the bat species documented in the project area in 2014 also winter in Utah and a few may be active during warmer periods in the winter.

Published studies of the impact of blasting vibrations on hibernating bats in underground mines or caves exist (Myers 1975; Pritchard 2012; WVDEP 2006 & 2007) but only broad generalizations can be drawn from these studies due to a variety of site-specific factors. The existing studies address two obvious possible impacts to roosting or hibernating bats subjected to blasting caused vibrations: 1) severe vibrations causing roof failure and crushing fatalities and, 2) lesser vibrations rousing bats from their hibernation torpor with the attendant negative effect of depleting critical body reserves.

Peak vibration levels from blasting are typically expressed as peak particle velocities (ppv, given in in/sec in the US) and are a function of charge weight, distance from the charge to the measuring point, and the site-specific geologic conditions between the charge and measuring point. While actual peak particle velocities can only be known precisely for a given situation by actual physical measurement, they can be reasonably estimated through equations derived from thousands of actual blasting vibration measurements. The studies suggest that peak vibration levels on the order of greater than 1 in/sec are necessary to cause roof failures (Siskind, 2000). The studies also indicate that to awake bats from hibernation torpor would require peak vibration levels greater than 0.2 in/sec. For the proposed action, being evaluated, vibration estimating formulas suggest that a ppv between 0.2 -0.4 in/sec could be expected in the Sunrise Adit, or the other adits, from the nearest projected shot hole (worst case) from the proposed Sunrise Mine pit. This estimate suggests that it is very unlikely that any acute adverse effect (death) would occur to any hibernating or roosting bats due to roof fall but that some risk exists that bats could be awakened from torpor.

Bats entering or leaving the adits would probably be disturbed by activity from the nearby pits, dumps, and haul roads. The noise and lights could disrupt flight and foraging patterns. Further, under the proposed action, eventually all the adits in the area would be destroyed. In order to minimize the potential for impacting bats, these adits will be monitored and efforts made to ensure that adits are free of bats prior to destroying.

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A worst case scenario would predict displacement and death of a few hundred individuals of several species, including Townsend's big-eared bats and fringed myotis, both sensitive species. A best case scenario would be based on no bats using the adits when mining commences (unlikely) and that impacts would be the loss of foraging habitat and displacement when bats return to the area in the spring. The actual impact is likely somewhere in between.

Migratory Birds

The potential direct impacts to migratory bird species would include the short-term loss of 140 acres and long-term loss of approximately 1,085 acres of potentially suitable breeding and foraging habitat including sagebrush and black sagebrush, as well as impacts from noise and dust, described below. Not all 1,225 acres would be disturbed at the same time as reclamation at one pit would occur as another is being mined and the same with exploration drilling. Direct impacts to breeding birds (including raptors) would be minimized by avoiding habitat removal between March 15 and July 31. If habitat removal or disturbance were to occur between March 15 and July 31, breeding bird surveys on public and private lands in the project area would be implemented, and appropriate mitigation prescribed in cooperation with the BLM, USFWS, and UDWR.

Vegetation removal in the MOA would reduce potential habitat for migratory bird nesting, cover, and foraging. These areas would be removed for the long term (the life of the project) and be unavailable for migratory birds during that time. An altered type of potentially suitable habitat would be available after reclamation activities. Impacts to migratory birds from habitat losses would be minor and long term. Due to the relatively small scale of operations (1,225 acres of disturbance) and extensive shrubland habitat available in the area, overall populations of migratory birds would not be affected.

Indirect impacts to habitat surrounding the disturbance areas (i.e., not directly disturbed) would occur as a result of project operations, specifically as a result of dust and noise introductions. Dust that falls on surrounding vegetation may make it less palatable for foraging as well as less suitable for bird nesting and breeding. Dust would be controlled in the project area by water trucks, which would lessen dust impacts. Overall, dust would have minor and long-term impacts on the suitability of migratory bird habitats surrounding the project area. Some individuals may utilize areas further away from project disturbances in avoidance of dust and project noise. Populations of migratory birds would not be affected.

Noise from project construction and operations, including the blasting activities, would make surrounding areas less suitable for nesting and breeding. Natural factors such as topography, vegetation, and temperature can reduce noise over distance.

Birds would likely displace to similar habitat away from the noise or become habituated to it, especially in areas where mining activities already occur. Human presence impacts would last for the life of the project. These impacts to nesting migratory bird habitat use would be long term (the life of the project) but minor because birds could nest elsewhere if the project area is unsuitable. Therefore, only nests that are initially undetected or established after construction may be adversely affected by noise or human presence.

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Big Game

Pronghorn that use or migrate through the disturbance areas may be affected by the loss of habitat as they would have to circumvent the project area. Further, pronghorn would be impacted by increased noise and traffic. They would move to other areas. However, these effects are not expected to extend to population growth rates or reproduction within the larger population (i.e., moderate effects) because of the small size of the project area.

There could be pronghorn-vehicle collisions and subsequent fatalities, although this is not anticipated. Impact to the population is anticipated to be minimal due to the limited use that pronghorn make of the project area and the large area of adjacent suitable habitat. No impacts are anticipated to the local pronghorn population or to hunting opportunities. For these reasons the project would be in compliance with Executive Order 13443, Facilitation of Hunting Heritage and Wildlife Conservation.

There would be a direct loss of approximately 1,225 acres of wildlife habitat from this project. The disturbance impacts would extend outward and would impact many more acres, depending upon species. Disturbances from the proposed project could allow for the expansion of cheatgrass and invasion of noxious weeds which would impact long-term habitat quality. Disturbed lands would be restored as soon as practicable and weeds would be controlled at all times. Reclamation seed mixes would contain species adapted to low precipitation, as well as sagebrush and native grasses and forbs.

Big game habitat losses are approximately 1,085 acres of crucial year-long pronghorn habitat would be lost for the long term (life of the project), until successful reclamation of the project area. In general, big game would be expected to habituate to the disturbances and continue to use the surrounding habitats as they do currently, including for seasonal movements. Thus, habitat fragmentation impacts to big game are expected to be minor and long term.

Threatened, Endangered, Candidate or Sensitive Animal Species

Species with a low probability of occurring in the project area (**Table 3.3-4**) are unlikely to be affected by the proposed action. These species include California condor (Endangered), Lewis' woodpecker (BLM Sensitive, Utah species of concern), long-billed curlew (BLM Sensitive, Utah species of concern), northern goshawk (BLM Sensitive, conservation agreement), and short-eared owl (BLM Sensitive, Utah species of concern).

In the unlikely event that California condor would forage in the project area, it would be unaffected by exploration activities. If a condor was observed, the Fish and Wildlife Service would be notified and activities would be delayed until the bird had cleared the area. Habitat in the project area is marginal for Lewis' woodpecker, long-billed curlew, northern goshawk, and short-eared owl. These species are very unlikely to occur in the project area and be affected by the Proposed Action.

Impacts to the special status birds with moderate to high potential to occur in the project area (bald eagle, burrowing owl, and ferruginous hawk) would be the same as general impacts discussed for Migratory Birds; long term and minor, with the implementation of spatial/seasonal

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buffers. Most of the general impacts described in this section for wildlife also apply to the remaining special status species, discussed below. Pre-construction surveys would be conducted to determine the presence of these species in the project area, and if found, the application of spatial and seasonal (timing) buffers would follow BLM guidance (BLM 2006).

Impacts to special status bats (**Table 3.3-4**; big free-tailed bat, fringed myotis, spotted bat, Townsend's big ear bat, and western red bat – all BLM Sensitive, Utah species of concern) would be the same as general impacts discussed for Bats, above. However, of these only the fringed myotis and Townsend's big ear bat were identified during bat surveys.

Impacts to pygmy rabbits would be negligible, as no pygmy rabbits were observed, habitat in the project area is marginal, and the habitat loss would not affect the potential for pygmy rabbits to establish in the area.

Impacts to kit fox would be negligible, as no kit fox or dens were observed, habitat in the project area is marginal, and the habitat loss would not affect the potential for kit fox to establish in the area. Kit fox would likely displace to similar habitat away from the noise and mining activity or become habituated to it, especially in areas where mining activities already occur.